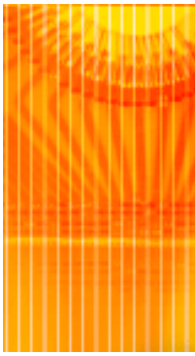
National Authority for Scientific Research
Romanian Committee for Research Infrastructures

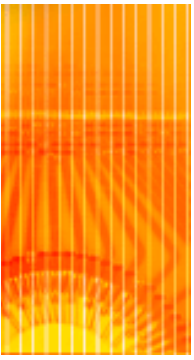




REPORT
Regarding Research Infrastructures of ROMANIA

Contents





4

Brief introduction

Dear readers,

It is already one year since Romania became a member of the European Union.

The substantial post-accession phase 2007-2013, which is ahead for the Romanian Area of Research, has been carefully prepared by the Romanian Government, through the ellaboration and adoption of the National Strategy for Research, Development and Innovation for 2007-2013.

The Strategy establishes, as an ambitious, yet realistic and ferm objective, the achivement of the critical mass and of the facilities that are necessary for performant research and for its international recognition, that is, for significantly increasing the quality of RDI activities. Consequently, these elements become key milestones for the evolution of the RDI system in our country.

Under these circumstances, the National Authority for Scientific Research (NASR) established a functional and stable framework, with the role to ensure the background for decisions and to help optimise the public efforts for the modernisation and efficient exploitation of research infrastructures. Thus, NASR established in April 2007 the Romanian Committee for Research Infrastructures – C.R.I.C., with 9 members - 5 representatives of the scientific community and 4 representatives of financing agencies (ministries involved in research financing), as a strategic forum providing recommendations and advice for the long term planning and the efficient allocation of resources necessary to develop research infrastructures.

The basic mission of C.R.I.C. is to define, and periodically review, the national priorities concerning the development of research infrastructures and to formulate recommendations for the phases to follow in their construction and operation, in the form of a national roadmap.

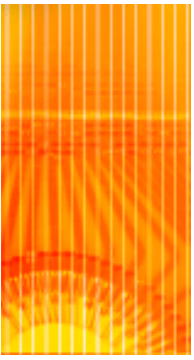
Prof. Dr. Gheorghe POPA, from the University "Alexandru Ioan Cuza" of Iaşi, a highly prestigious representative of the scientific community of Romania, was appointed to chair the Committee.

The Report that C.R.I.C. presented to NASR after almost one year of activity responds to the initial demand and configures the roadmap and milestones considered as necessary for consolidating the national research infrastructure, in accordance to the requirements imposed by its integration in the European Research Area.

The recommendations formulated in the C.R.I.C. Report promote the development of 19 new research centres, in scientific and technical fields considered national priorities and also relevant for the current priorities and tendencies featured by the present evolution of european research.

The perspective of development for the investment objectives promoted by the C.R.I.C. Report takes into account the need for both the structural compatibility and the operational correlation of the national infrastructure with the pan-european infrastructures included in the european research infrastructures roadmap, established in 2006 by the European Strategic Forum for Research Infrastructures – ESFRI. Also, the Report estimates the necessary financial effort associated to each objective and presents the financing sources available through the Programme Capacities from the National Plan for Research, Development and Innovation for 2007 – 2013 – NP II and the Priority axis 2 of the Sectoral Operational Programme for the increase of economic competitiveness.

I wish to express all my appreciation and to address sincere thanks to the members of C.R.I.C. for their work during the first year of activity of the Committee.



I am quite convinced that the Report will respond to the expectations of the scientific community in our country and will determine an active involvement in sustaining and achieving the objectives that it promotes.

Prof. Dr. Eng. Anton ANTON

President of the National Authority for Scientific Research

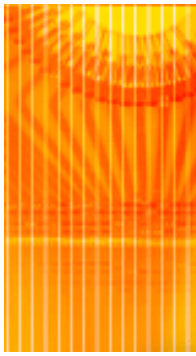
Foreword

In April 2007 we received the honorable invitation from the National Authority for Scientific Research to lead the Romanian Committee for Research Infrastructures – C.R.I.C.

The orientation of research activities towards large infrastructures requires long-term planning, not only from the part of decision- makers but also from the part of researchers. In this respect, C.R.I.C. comes to support the actions of the National Authority for Scientific Research (NASR) aiming to accomplish a consolidated portfolio of projects for investments in research infrastructures (for example, by the IMPACT Programme) and to have a timely updating of the volume of information related to this matter.

We are now at the moment of presenting our report after almost a year of analyses, debates within C.R.I.C., regarding the current status of research infrastructure in Romania, its necessities and priorities of development in accordance with the National Strategy for Research&Development and Innovation for 2007-2013.

The C.R.I.C. Report aims to orient the infrastructure projects proposals from the point of view of the types of objectives that will have priority support. In this respect, C.R.I.C. has examined the vastness and cost of such proposals and recommended a framework for their financing by using a coherent set of criteria. The report is expected to become a catalyst for the efforts aiming to achieve the most significant and urgent strategic investments in research infrastructures.



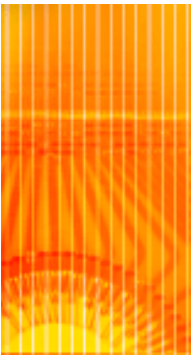
The C.R.I.C. Report targets the long-term research directions of Romania, proposing a list of priorities, along with recommendations regarding their achievements. This constitutes a national roadmap for research infrastructures, that will be annually updated, after analyzing the national opportunities of research and by monitoring the new opportunities that come up in science at international level. The national roadmap takes into consideration the synergy with the European roadmap for research infrastructures, such as it was established by the European Strategic Forum for Research Infrastructures (ESFRI), so that policy makers in the research domain would have the information required for their decisions. For instance, in particular cases, due to the very significant resources that are necessary, it is more efficient to participate in a project for a pan-European infrastructure and to develop only the infrastructure that is strictly necessary for correlation with it, than to engage independently in such a direction at national level.

In these circumstance, the aim of this report is to provide, on one hand, to research policy makers, and on the other hand, to the Romanian academic community at large, as well as to the business community, an orientation regarding the potential directions for development of large research infrastructures, needed for facilitating the integration into the European Research Area. The members of C.R.I.C. also express their belief that the National Authority for Scientific Research will pay much attention to the process of evaluation of the project proposals, by involving most prestigious experts – evaluators at national and international level, in order to develop a climate of trust and confidence in the selection of the best projects, proposed by credible and highly performing institutions and specialists.

January 2008

Prof. Dr. Gheorghe POPA

President of the Romanian Committee for Research Infrastructures



The role of the Romanian Committee for Research Infrastructures

C.R.I.C.

The National Strategy for Research, Development and Innovation (RDI) for 2007 - 2013, adopted by the Government of Romania in march 2007, assigns a crucial role to research infrastructure to support the development of knowledge and of human resources for research.

Two of the six components of the National Plan for Research, Development and Innovation for 2007 – 2013 – the 2nd National RDI Plan – NP II are directly oriented towards this direction, and the other four have research infrastructure as the main pillar for supporting the activities.

The research infrastructures have special characteristics, among which we can enumerate the most important:

- the financial resources originate from several financers;
- the complexity and dimensions of these infrastructures requires long-term planning,
- they are commonly used by both the internal users, the staff of the administrating entities, and by external users,
- they may have (and must have), in the medium term, a major impact on the evolution of research and on the development and progress of the economic environment in the country.

At international level, by research infrastructure it is understood:

- equipment of very high value and complexity (for example ≥ Euro 100.000), used only by specialized research staff;
- investment objectives for research;
- high capacity and complexity scientific databases (with both free and restricted access).

The establishment and use of the research infrastructure developed on the basis of public funds requires a special attention from the managers of public funds and from the administrators of infrastructures, for ensuring the financial and institutional framework proper to their reasonable and efficient use and development.
For Romania, the intensification and, especially, the optimization of the public effort in the establishment, modernization and use of the research infrastructure are main elements recommended both by the National Strategy for RDI, as well as by the results of the survey on research infrastructures, conducted by NASR between 2005 and 2006.

The Romanian Committee for Research Infrastructures (C.R.I.C.) was appointed by Decision of the President of NASR on 2 April 2007, being composed of 5 representatives of the scientific community and 4 representatives of financing agencies (ministries involved in research financing).
C.R.I.C. is responsible for ensuring a solid basis for the evaluation of the long-term needs for the development of research infrastructures.

This body was constituted both as a scientific advisory council of NASR for the implementation of the programme "Capacities" of the 2nd National RDI Plan, and a strategic forum, that will draw up reports and will make recommendations for the allocation of resources necessary to create, develop and use the research infrastructure, important to the Romanian scientific community.
C.R.I.C. proposes the allocation of resources for the infrastructure to be developed partially or totally from Romanian public funds both on the territory of Romania and abroad.
The main mission of C.R.I.C. is to establish the national priorities for research infrastructures and to draw up a report regarding the stages to be followed in their construction and operation (Roadmap). This report addresses as main issues: purpose, definitions, categories, priorities, special potential fields.

In establishing the priorities, the following categories of infrastructures have been considered:
a) national:

- research facilities of national interest, such as the National Network for Education and Research (RoEduNet), high-complexity laboratories and equipment;
- large scientific and documentary databases for research, developed in Romania or for which it is necessary to purchase access licences (ISI databases, libraries);

b) international:

- infrastructures constructed or operated under international co-operation on the basis of agreements or within organizations and projects where Romania participates, such as:
  1. ESA, CERN, ITER, IUCN Dubna;
  2. projects from the list of pan-european research infrastructures established by ESFRI;
- other infrastructures developed under national and / or international partnership.

As regards the fields with special potential, the following are to be considered:

- the priorities regarding the research infrastructure projects identified by consulting the scientific and business communities, also including the analysis of the portfolio of the IMPACT projects (bottom – up approach),
- the national high-priority projects (top-down approach),
- the infrastructure projects that are national priorities considered at European and international level.

For the competition regarding large investment projects for the development of public research infrastructures, jointly launched in December 2007, under the programme Capacities of NP II — and also under the Sectoral Operational Programme – Increase of the Economic Competitiveness – Priority Axis 2 – Operation 2.2.1- Development of public research infrastructures, C.R.I.C. is part of the competition's Selection Committee that has the following tasks:

- Approval of the preliminary report of evaluation,
- Appointment of the Commission for Claims,
- Delimitation of the projects that got the same scoring,
- Implementation of selection-specific rules,
- Drawing up the final assessment report and the list with proposals selected for financing, and their submitting for approval to the president of NASR.

The evaluation of the projects proposals will be made by foreign evaluators in evaluation panels composed of three members each.

Structure of C.R.I.C.

By the decision of the President of NASR of 2 April 2007, the following were nominated to be members of this debate Forum:

President:

Prof. Dr. Gheorghe POPA – University "Alexandru Ioan Cuza" Iaşi

Members:

Acad. Bogdan SIMIONESCU – Institute of Macromolecular Chemistry "Petru Poni" Iaşi
Dipl. Eng. Gabriel NEAGU, PhD. – National R&D Institute for Informatics – ICI Bucharest
Octavian RUSU, PhD. – RoEduNet
Adrian DUŞA, PhD. – University of Bucharest
Dipl. Eng. Nicolae HRISTEA, PhD. – Director, Ministry of Agriculture and Rural Development
Col. Dipl. Eng. Marin TĂNASE, PhD. – Ministry of Defense
Dipl. Eng. Petru IANC, PhD. – Director General, Ministry of Economy and Finances
Dipl. Eng. Dan DOBRESCU – Head Commissary, Ministry of Interior and Administrative Reform
Prof. Dr. Dipl. Eng. Lucian SANDU– Technical University of Constructions, Bucharest

Secretariat of C.R.I.C. is supplied by the National Authority for Scientific Research, as it follows:

Ionel ANDREI – Director General, NASR
Dana GHEORGHE - Director General, NASR
Elena TOMA, PhD. – counselor for European affairs, structural funds
Viorel IOANĂŞ – counselor, NASR
Mihaela GUDA – counselor, NASR

Defining research infrastructures

Traditionally, a research infrastructure (including associated human resources) is represented by major equipment or sets of instruments as well as by knowledge resources such as collections, archives and databases.

In the context of this report, the large research infrastructures are defined as follows:

> Installations, equipment or tools, of special vastness and complexity – given by the costs for procurement, operation, maintenance and/or for facilitating users' access, and which ensure for the scientific community the essential conditions for both fundamental and applied research.

The research infrastructures may be organized in either a unique location, or distributed in multiple locations or in virtual locations – the service being provided electronically. The eInfrastructure-type objectives (electronic infrastructures: high/speed networks, Grid, software-associated products) are included in this last category. For these infrastructures, it is necessary to ensure a high degree of information structuring, through data management systems that should enable high capacity exchange and communication of information with potential users.

These infrastructures are necessary for ensuring competitiveness of the Romanian research at international top level, in various scientific and technological fields.

In this direction, the projects that will be included in the roadmap are characterized by very high costs (at least, Euro 600.000) and by a long period of development that requires expertise and a stable sustainable institutional framework.

Additionally, these projects present the following characteristics: they provide socioeconomic benefits at national level

- they are harmonized with the common interests of the scientific community at national level
- they have a strategic impact in top scientific fields
- they are interoperable and competitive at international level. These characteristics may be compulsory for fields in which the topics considered are transnational and require international cooperation (examples: energy field, environment, security, etc)
- they are used at full capacity on a multi-disciplinary basis, and the access is free for all the interested researchers
- they valorize the expertise existing in the field, in a co-operative manner. There are fields with interdisciplinary character that require the participation of specialists from various fields and even of the research institutions from various fields, that have to use complex and expensive infrastructures. In these cases, it is necessary to institutionalize the co-operations in order to use efficiently the infrastructure and to create the conditions for solving out the specific problems. Examples: field of fundamental sciences, environment, energy field, health, etc
- they have long term impact on the quality of people's life
- they stimulate the interest of young people and attract them in the research career. The development of a modern and efficient infrastructure will create a strong motivation for stabilizing the "brain drain" phenomenon and creating the premises for its reversal
- they have a determinant role in training new generations of researchers
- they stimulate the transfer of knowledge and technology.

Financing instruments

Since 2007, NASR considerably diversified the instruments for the funding of research with the purpose to fulfill the objectives of the National Strategy for RDI 2007-2013. As regards the investments in RD infrastructures, the financing resources are the following:

A. Programme Capacities within NP II. By Module I, this programme finances small investment projects up to Lei 2 million, consisting of purchases of equipment, as well as large investment projects, where the value of the non-reimbursable funding ranges between 2 million and 60 million lei, and besides purchases of equipment witch also contain activities of construction/enlargement/modernization of buildings. Both types of projects are dedicated to the public research organizations. Competitions for small projects have been annually organized since 2007. The first competition for large projects was launched in December 2007, the entire calendar for the following competitions being recommended to be set out until the end of 2008.

B. Priority axis 2 of Sectoral Operational Programme for the increase of the economic competitiveness. This programme is financed from structural funds from the European Union through the European Regional Development Fund and with contribution of Romania (about 15% of the funds). The Priority Axis 2 "Competitiveness through RDI" contains 9 operations out of which 4 are designed for investment projects.

B.1. Operation 2.2.1 has as objective the development of the RD infrastructure in the public research organizations through procurement of equipment and devices that may be accompanied by activities of construction / enlargement / modernization of buildings. The operation targets only 5 of the priority fields of the National RDI Strategy: energy, environment, health, agriculture, food safety and security and innovative materials, processes and products. In December 2007 a joint competition was launched together with Capacities Module I for investments projects for large RD infrastructures (max. 50 million Euro), for which the value of the non-reimbursable financing is comprised between 2 million and 60 million Lei. The following competitions on this operation will be organized in 2009 and 2011.

B.2. The Operation 2.2.2 has as objective the development of poles of excellence, defined as cluster-type innovative structures, that should get together innovative enterprises, training centers, institutions of the local administration, banks etc. around powerful research institutions and universities in the fields with economic potential. The operation mainly supports the development of joint facilities of the pole, while the research activities of the pole and individual investments in research infrastructure may be supported by other operations within the priority axis. By joint facilities are understood:

- facilities for research and training centers;
- research infrastructures with free access for all the members of the pole: laboratories, testing facilities;
- broadband network infrastructures.

The maximum value of the non-reimbursable financing for a project is 15 million Lei. The first competition for this operation is scheduled in 2009.

B.3. The Operation 2.2.3 aims at the development of networks of RD centers, coordinated at national level, and connected to European and international networks in the field (e.g. GRID, GEANT). Activities for connecting research organizations to the GRID networks and for upgrading the national network for research and education - RoEduNet (beneficiary: RoEdu Net) will be financed. The first competitions will be organized in 2008.

B.4. The Operation 2.3.2 addresses enterprises and targets the development of their RD infrastructure by creating new jobs in research. The total value of a project cannot exceed 50 million Euro, and the value of the public financing is of maximum 50% of the eligible expenses for large enterprises, 60% for medium enterprises and 70% for the small ones respectively (in the region Bucharest-Ilfov by 10% less for every category). From 2008 onwards, annual competitions will be organized until the funds allocated for the operation are finished.

C. Programme "Supporting Institutional Performance" within NP II

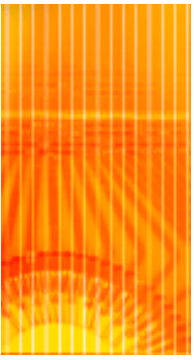
This programme, component of NP II, will support the activities included in the action plans that implement the individual strategies of public RD units and institutions. Activities in the action plans will also promote the institutional development of public RD organizations, supporting for the development of their research infrastructure.

D. Capital investments from the NASR budget

The investment objectives and purchases of equipment for the units and institutions functioning under the NASR coordination and subordination will benefit also from state budget allocations thorugh the NASR budget.

E. Financing the RD facilities of national interest

The expenses for the maintenance and use of the national interest RD facilities, established according to the criteria and list approved by the Governmental Decision, will be supported from the funds allocated from the NASR state budget. The List of these facilities, approved by the Governmental Decision no. 1428/2004, can be found in Annex 1.



Criteria of assessment

To substantiate the priorities regarding the investment projects for developing research infrastructures of national interest, C.R.I.C. has used the following criteria and sub-criteria of assessment:

1. Relevance

1.1. Interest that the project represents at a national, regional level

1.2. Concordance with the international projects in the field, external compatibility (EU, NATO)

1.3. Orientation towards leading edge research (NP RDI II, FP7)

2. Potential of use

2.1. Existence of a critical mass of potential users / beneficiaries

2.2. Potential of increasing the number of users / beneficiaries (connection with the national system of training of the human resources)

3. Proportionality of the investment in relation with:

3.1. Relevance of infrastructure

3.2. Potential of its use

4. Coordination of the achievement, use and future development of the infrastructure

4.1. The solution of co-ordination: Research Institution/ Initiative Group, Consortium of institutions/ Professional Association/ Organism of co-ordination at national level (Romanian Academy, National Authority for Scientific research - NASR, Ministry of Education, Research and Youth - MERY, National Council for Research in Universities – CNCSIS, National Centre for R&D Programmes Management - CNMP etc.)

4.2. Ensuring the long-term vision: scientific, technical (administration, specialized human resource), financial

5. Quality of the implementation environment

5.1. Valorization of the expertise in the field

5.2. Existence of the conditions of implementation: logistics, utilities, administration staff, financial support for the following period (min. 3 years)

5.3. Availability of data regarding the infrastructure's use

6. Access to infrastructure

6.1. Type of access: local, distributed, virtual

6.2. Existence of a policy and associated technical solutions for granting access priorities for the mass of users

7. Interoperability

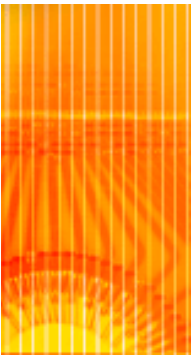
7.1. Logical / functional connection with other research infrastructure components

7.2. Technical compatibility with similar infrastructures on an international plan

Also, for assessing research infrastructure priorities C.R.I.C. has taken into account the balanced coverage of all priority fields that are presented in the following chapter.

The correlation between the above assessment criteria / sub-criteria and the structure of the record used to present the C.R.I.C. proposals for priority investment projects is presented in the following table, according to the sections included in the record

Assessment criteria and sub-criteria		Sections of the presentation record						
		Description	Justification	Impact	Operational sustainability	Investment budget	Duration of achievement	Duration of use
1	1.1	x	x	x				
	1.2	x	x					
	1.3	x	x	x				x
2	2.1		x	x	x			
	2.2		x	x	x			x
3	3.1		x			x		
	3.2		x			x		
4	4.1	x			x		x	
	4.2		x					x
5	5.1				x	x	x	
	5.2				x	x	x	
	5.3	x	x					
6	6.1			x				
	6.2	x						
7	7.1	x		x				
	7.2	x			x			x



Priorities for investments in large research infrastructures

The National Strategy for RDI 2007-2013, approved by Government Decision no.217/2007 and the National Plan for Research - Development and Innovation for 2007-2013 (NP II), approved by Government Decision no. 475/2007, as an instrument for the strategy to become operational, have both been considered when establishing the priorities for investments in large scientific research infrastructures. On the other hand, in spite of the financial efforts made by the Government of Romania, between 2005 and 2007, for the modernization and development of the research infrastructure and for attracting young specialists in this field of activity, the scientific research at national level still has to catch up with the other European Union member states, especially from the point of view of the technical and technological level of the research infrastructure and, as a consequence, from the point of the research topics.

Likewise, the analysis of the economic status of the country, and of the contribution of scientific research to supporting and stimulating the development of the national economy and the development of knowledge in general, carried out when drawing up the national strategy for RDI, has led to the result that there are big disparities between different regions of the country as regards their contribution to research activities. Big differences are also recorded between research fields, institutions or teams in the country as concerns the scientific and technological level of research, results obtained and the degree of their national and international recognition.

The tendencies at European and global level have been also taken into consideration in establishing the priorities regarding large investments in scientific research. These tendencies show that two major threats for the present civilization have to be considered: the diminution of classical resources of energy and the increase of pollution in the atmosphere. These threats have major consequences, particularly due to the phenomenon of global heating. These threats are interdependent, with long and medium term consequences, and require urgent political and scientific solutions. Some of these solutions consist in discovering some new sources of energy, drawing up new non-polluting technologies and knowing the origin and properties of the living matter and conditions for its preservations.

Other elements taken into consideration in establishing the priorities for large investments in scientific research field are related to: i) the special scientific, technical or cultural potential of the field concerned and ii) the quality and competences existing in the respective field, namely the human and material potential available in the national system of scientific research, taking into account that the system is still in process of reorientation under the conditions of market economy.

The analysis is focused on fields with special potential, namely fields established by the National Strategy for RDI, that have a large area of qualitative and quantitative expansion, with multiple implications in the development of science, technology and knowledge. Considering the specificity of the national system for scientific research, by field with special potential, it was understood that field in which good, visible results at national and international level were obtained, that may provide conditions for further development.

Taking into consideration the above-mentioned arguments, the following concrete priorities of investments in research infrastructure according to the priority thematic fields of the National Strategy for RDI were identified:

Information and Communication Technologies

The analysis of the national system for scientific research, carried out between 2005 and 2006, has shown that the field of information and communications technology represents an absolute priority, at least from the point of view of the exchange of information in general and of the scientific information in particular, as well as of the enlargement and consolidation of the co-operations at national level and especially at international level.

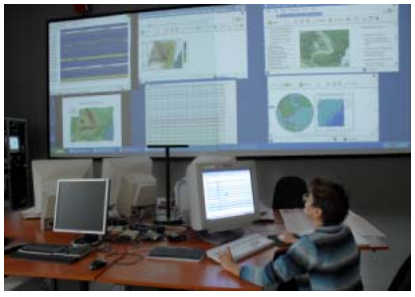
Therefore, substantial funds are proposed to be allocated for creating a national high-speed communications network of Grid infrastructure and for the completion of a unitary system.

On the other hand, the enlargement of the electronic systems for monitoring and controlling the technological processes, working protocols, data acquisition and processing requires a horizontal development of the transducers, data communication systems, data storage and processing systems. Algorithms and general and / or specialized computing programmes are also necessary depending on the requested application. This field tends to cover most of the economic and scientific activities, administration or social and cultural activities, representing an essential support for promoting the interdisciplinary character of high complexity and impact research projects. The Romanian education system, as well as some native qualities of the population, proven by the fame of our specialists at international level in the field of information and communications technology, situates this field on a favorable position with real potential of development in the near future.

Energy

The energy field represents a priority field with transnational importance. This situation requires that the investments in the field to be considered in correlation with the participation of the Romanian research in international co-operations, especially within the EURATOM programme, through the two nuclear components, referring to the reactions of fusion and fission. At national level, investments for a research center in the field of ecological fuels are being proposed, focusing, in first place, on the technologies using hydrogen as energetic agent. These particularities of the field, require on one hand, a detaliation of the strategy for the energy field, as support for some large investments both from the Ministry of Education, Research and Youth and from the other ministries in the field. These investments should foster, on the other hand, those directions of research that would maintain Romania in the group of the countries engaged in solving out, at global scale, the energy problem. Thus, taking into account the fact that, since1999, our country is a member of EFDA and that, within the association, many research institutions and teams working in the field of the nuclear fusion participate in international co-operations, both in fundamental research of physics of plasma and in research regarding the accomplishment of the ITER and IFMIF facility, it is preferable to make important investments in those components in which the Romanian researchers have proved competence and in which there are good chances for efficient co-ordination of the field.

Environment



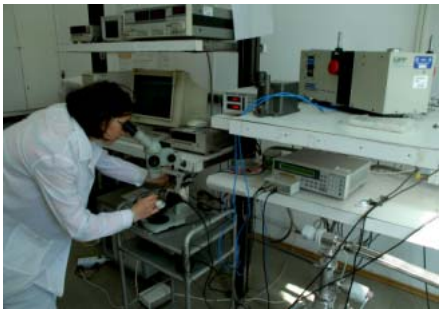
Priorities for the environment field promote the development of the infrastructure necessary for research focusing on the ecologic rehabilitation of the environment and the increase of life quality. Under the present conditions of technical and technological development, we assist to contradictory tendencies. On one hand, we can speak about an increase in the quality of life, confirmed by the increase of the average duration of life, especially in the industrially and scientifically developed countries. But, on the other hand, the same technological development has led and leads to changes in the natural conditions of the environment that tend to become irreversible and that can, on long term, endanger the survival of the human civilization. This reality leads to the need for inter- and multi-disciplinary approaches regarding the issue of biodiversity, for studying the impact of the human activity on the environment and for reconsidering present industrial technologies. Romania is facing the need to make urgent options, at least for some regions of the country, concerning the recovery of natural conditions and the adoption of measures and norms for preserving the environment and for the large scale use of ecological and bio-ecological technologies in industry and in the agri-food sector. These issues recommend making large investments for the infrastructure specific to the research in the field of ecological reconstruction of the environment, to ensure an important research potential distributed in all the regions of the country.

A particular priority is represented by the Danube Delta as one of the most important natural reservations in Europe, with a major contribution to the natural balance of the area, and with an important tourism and economic potential. The restoration of this potential requires, first of all, important investments in scientific research infrastructure, research that is compulsory for obtaining and supplying the data necessary for drawing up a coherent and efficient programme for the ecological rehabilitation and for the valorisation of the potential of the area.

Physics and fundamental sciences

In the field of fundamental sciences -mathematics, physics and chemistry- Romania has the best international visibility. These fields have a remarkable potential of development if adequate measures for further ensuring the proper training of the young generations are taken. Finding solutions to maintain the good results and to develop these fields of activity, as premise of our participation with equal rights in the European Union, represents a national priority.

Romania may and must participate in the next stage in European projects related to fundamental studies in fields of common interest, such as: LHC (Large Hadron Collider, installed in CERN, Geneva, the biggest accelerator of particles in the world, which is undergoing testing and commissioning), ITER (Intrenational Tokamak Energy Reactor, planned to be accomplished at Cadarache, France, as the largest world project for sources of power), FAIR (Facility for Antiproton and Ion Research, planned to be accomplished at Darmstadt, Germany). All these fields and facilities ensure medium and long term projects with major impact on the development of future science and technologies. This programme of investments in high-value equipment must be integrated into the European effort in the field, and take into consideration some complex facilities, some of them placed in Romania. Projects like XFEL (The European X-Ray Free Electron Laser, planned to be established in Germany) or ELI (Extreme Light Infrastructure, to be possibly installed in Romania) may well be achievable, if the clear determination exists, and it is highly desirable that they are promoted and accomplished.



The current situation regarding the involvement of our country in infrastructure projects that are to be financed by the 7th Framework Programme of the European Commission is described hereinafter.

A particular component of the fundamental and applied physics research of major importance in this period is represented by the surface and interface science. The development of this field at global level and its implications in multiple interdisciplinary fields justifies fully the financing of some major investments for creating a national network of research laboratories and teams, supporting the development of competence in this particular scientific field.

Health

The health care system, which has a good reputation for the training of specialists, needs investments in research infrastructure for introducing new methods and techniques in the field of genetics and molecular biology, for the monitoring of the population health, the prevention and identification of diseases, for the treatment and recovery of the patients. It is important to take into account the European tendencies and participation of Romania in the joint effort of creating Pan-European networks for bio-molecular resources and data banks, for creating research centers distributed on the continent for facilitating the transfer of new knowledge in the field of medical research towards the clinical practice. Romania should make the effort to participate in the development and use of complex systems of research and treatment that are developed at European level (accelerators of particles, synchrotron radiation, etc).

At national level, in the health care field, it is required with priority to guide the financial efforts towards genetics and molecular biology, components with major impact in the present day medicine. Presently, the paradigm in the field of medicine consists in commuting the reactive medicine towards a predictive and preventive medicine. The health of population and the increase of life quality can be evaluated by measuring the molecular and fundamental bio-chemical factors in order to understand current pathologies, changes incurred in the patterns of health and to introduce personalized treatments based on the genetic imprint.

On the other hand, the evolution of the economic circumstances and the living standard of the population, especially over the last three years, require a special attention for monitoring and doing research into the infectious diseases. They require the orientation of the high value research investments towards creating a national system for scientific research, system that should come to support and complete the efforts made in the national sanitary system.

Agriculture, food safety and security

More than in other fields, the research infrastructure in the agriculture field has suffered a serious decline, caused by insufficient financial support for maintenance and modernization.
The population health and the quality of life are strongly related to ensuring the food production, necessary for the population, under strict conditions of food quality. Consequently, the agriculture and food production constitutes a priority interest field that needs urgent and consistent investments and research infrastructure, infrastructure that should ensure conditions for doing research in the field of food quality, to ensure the material support for the modernization of genetic resources of cereals and technical plants. This infrastructure should also provide new perspectives for the national research in agriculture and food safety, including international co-operation, with research partners from Europe and from the rest of the world.

Biotechnologies

Strongly connected to the health care field, to environment protection and to preservation of raw material resources, the development of biotechnologies is particularly outstanding at international level. This field promises the development of new ecological technologies, generally in closed cycles, by minimizing or even avoiding the production of waste and by increasing the economic efficiency. The field is complex and requires multiple interdisciplinary co-operations, with a strong biological component at molecular and genetic level. The necessary investments rise to significant costs that cannot be covered but through a state-budget-supported programme, as it is considered in this priority programme. The purpose of these investments is to create a national network of laboratories and scientific research centers, similar to the systems developed at European level, and which, through the results obtained, should ensure the European integration of this particular field.

Materials, processes and innovative products

The science of materials and of processes generating new materials is a field under fast development, all around the world. It is a field important for most of the other fields of activity, starting from the domestic uses and finishing with the requirements of technologies in advanced fields (aeronautics, spatial, military fields).
The materials science is an interdisciplinary field. The design, characterization, production and use of new materials requires fundamental knowledge of physics, chemistry and/or

biology. High-performance mathematic models and information systems capable to process large volumes of data related to the field-specific research are necessary. An infrastructure of the highest technical level and highly-qualified personnel are also necessary. In the country, there are several institutions and teams involved in materials science research, located in all large universities and research centers in Romania. A research infrastructure with equipment that enables passing to a new stage of research is already in place. This infrastructure makes possible the development of a national network in the field concerned, which would facilitate the participation in international programmes and cooperations. Passing to the new stage, within an integrated system for research and for training of specialists, requires new infrastructure investments on the basis of a new coherent national medium-term programme.

A very dynamic component, with great potential of development at industrial scale, is represented by the field of nanostructural materials and techniques and technologies for the production and use of these structures. Consequently, this report, proposes financing some major investments in the field of both materials and micro and nanotechnologies (for example: mechatronics, robotics etc).

Space and security

The fast evolution in fields such processing and storage of information, transports, continuous monitoring and environmental protection, resources protection etc. requires an increased attention and important investments in the development of safety and security systems. Such measures have been taken, and are still being taken both at national and European and international level. In this context, our country should also consider as priority, an investment with significant value that, at least in the present stage, should be oriented towards the development of a platform for research, testing and assessment for security and defense systems in the terrestrial, aerial and naval fields.

Social and economic and humanistic research

The research in the economic, humanistic, social and cultural fields is also considered a priority. The infrastructure requires urgent reconsideration for identifying, assessing and preserving the cultural and national patrimony, as a binding condition for legitimizing and maintaining the national identity in the new European context. The way the relationship between an individual and a group is considered must be approached in a new manner, namely as an essential element of the performance of both the individual and of the group where he belongs. For that, a specific investment is necessary to approach the scientific issues focused on the fields with great practical impact on interpersonal relationships.

These fields may have a remarkable potential of development under the conditions that the educational system will take the appropriate measures for ensuring a proper training of the young generations. Finding solutions for maintaining good results and developing these fields of activity as premise of our participation with equal rights in the European Union is a national priority. The development of a strongly connected educational system, integrating research in the higher education stages, will ensure not only favorable conditions of development for the national economy, but also a recognition of our national values and an equitable integration of Romanians into the European economic, social and cultural systems.

Romania is also facing the need to develop national systems for monitoring and analyzing the economic and social changes on the national territory, for creating a national network of centers specialized in the identification of the cultural and artistic patrimony, its rehabilitation and preservation and, where appropriate, its effective valorisation. In some of these fields, Romania has not only experience but also international recognition (ex.: the archeological field). Therefore, the investments in these fields are welcomed and have real chances of development with important results at national and European level.

European Strategy Forumon
on Research Infrastructures

ESFRI

SEVENTH FRAMEWORK
PROGRAMME

Projects for Pan European Infrastructures with Romanian participation in preparation under FP7

In 2002, the European Strategic Forum for Research Infrastructures – ESFRI was set-up – grouping the representatives of the Ministries of Research in the European Union, with the power to debate strategic issues related to research infrastructures. In the second semester of the year 2004, the EU Council requested that ESFRI, in close cooperation with the EU Commission, should accomplish a European Roadmap containing the new large research infrastructures to be constructed by the Member States. The outcome of these consultations that are based on international assessments was materialized in the first European Roadmap for new large research infrastructures.

The ESFRI Roadmap 2006 was adopted by ESFRI at the meeting held on 28 - 29 September 2006. It contains a list of 35 proposals for new Pan European interest facilities or major upgrading of the existing ones, that addresses some key research areas: Environment; Energy; Materials Sciences; Astrophysics, Astronomy, Nuclear Physics and Physics of Particles; Life Sciences and Biomedical Sciences; Social and Humanistic Sciences; Informatics and Analysis of Data. The ESFRI Roadmap will be periodically updated (www.cordis.europa.eu/esfri/).

Member States are responsible for carrying out these projects but the European Commission will also support them. In this respect, special actions were included in the work programme of the specific programme "Capacities" under FP7, in order to support the preparatory phase of the projects in the roadmap, and the first call 2006/2007 was designed for this purpose. This stage aims to bring the ESFRI projects in a mature financial and legal status. Romania participates in 9 of the proposals on the ESFRI 2006 list, according to the table below:

Domain	Code	Project	ESFRI List	Partner from Romania
Social Sciences & Humanities	11.1	Council of European Social Science Data Archives - CESSDA	Yes	University of Bucharest – Romanian Archives of Social Data
	11.2	Common Language Resources and Technology Initiative - CLARIN	Yes	Technical University "Gheorghe Asachi", Iaşi
Environmental Sciences	11.3	Research Infrastructures Network for Research in Biodiversity - LIFEWATCH	Yes	University of Bucharest
	11.4	ERICON Aurora Borealis	Yes	Antarctic Romanian Foundation
Biomedical and Life Sciences	11.5	European Bio-Banking and Biomolecular Resources - BBMRI	Yes	National R&D Institute "Victor Babeş", Bucharest
Astronomy, Astrophysics, Nuclear and Particle Physics	11.6	Production and study of rare isotope radioactive beams - SPIRAL2	Yes	National R&D Institute for Physics and Nuclear Engineering Horia Hulubei - IFIN-HH, Bucharest
	11.7	Underwater Neutrino Observatory - KM3NET	Yes	Institute of Spatial Sciences, Bucharest
	11.8	Facility for Antiproton and Ion Research - FAIR	Yes	National R&D Institute for Physics and Nuclear Engineering Horia Hulubei - IFIN-HH, Bucharest
Material Sciences	11.9	Extreme Light Infrastructure - ELI	Yes	National R&D Institute for Laser, Plasma and Radiation Physics - INFLPR, Bucharest

For these proposals the Romanian partners will receive support through the programmes financed from public funds for the following activities included in the projects' working packages: RTD and demonstrative activities, activities that are not financed at Community level, and activities of promotion and dissemination of the projects' results. C.R.I.C. also recommends actions to be initiated and encourages any efforts, for placing and developing on the territory of Romania any of the Pan-European infrastructures comprised in the ESFRI list.

Proposals of C.R.I.C. for priority investment projects

Code	Name	Status
1	Information and Communications Technology	
1.1	High-speed communications network for education and research	
1.2	GRID National Infrastructure for research	
1.3	Center for research in advanced optical communications technologies and networks	
1.4	Center for research in information systems security	
1.5	Unitary system for the correlation of scientific and encyclopedic libraries	
1.6	Unitary system for the inventory of research projects and results	
2	Energy	
2.1	RD Platform for ecologic fuels	
3	Environment	
3.1	Institute for Research-Development in ecological reconstruction of the environment	
3.2	« Danube Delta » International Research Center	
4	Physics	
4.1	Institute for surface and interface science	
5	Health	
5.1	Institute for research in biosystems and pharmacogenomics	
5.2	Romanian Center for biomolecular research applied in infectious diseases	
6	Agriculture, food safety and security	
6.1	Center for research in the quality and competitiveness of foodstuffs	
6.2	Technical basis for the modernization of the genetic resources in cereals and technical plants	
7	Biotechnologies, biology and genetics	
7.1	Platform for research in biotechnology	
8	Innovative materials, processes and products	
8.1	Open laboratory for the synthesis, testing and assessment of nanostructural composite systems and biocompatible hybrid systems	
8.2	Center for advanced research in robotics and integrated micro-nanomecatronics	
9	Space and security	
9.1	Platform for research, testing and assessment for terrestrial, air and naval security and defense systems	
10	Socioeconomic and humanistic research	
10.1	National Institute for the scientific investigation and protection of the cultural patrimony	

1. Technology of Information and Communication

1.1. High-speed communications network for education and research

Scientific field:
Information and Communication Technologies

Description:
RoEduNet2 Project aims to develop a national network for research and education based on modern technologies (DWDM), by using the optical fiber as transmission support. This network will provide services to the Romanian research and education community, will ensure the infrastructure necessary for the connection to the European research and education network and will enable the adjustment to the dynamic requirements of the research applications, particularly the GRID applications.
The project will ensure the necessary capacity of data traffic at county, regional and national level, for the education development programmes at all grade levels.

Justification: The project will ensure data communications through an optical fiber structure of about 4200 km in length, a number of 4 up to 20 communications channels on each pair, depending on the needs, with the possibility of extension to 40 channels in the first 5 years, and to 80 channels after 5 years.

Investment Impact :
The main objectives of the RoEduNet2 project are:

- developing the communications network for research and education in Romania, in order to provide broadband communications channels and quality services and to enable the active involvement of Romania in the development of the GEANT network in the Eastern Europe and Black Sea area;
- Eliminating the technological differences between RoEduNet and same type networks in the European Union members states, facilitating scientific and cross-borders co-operation and creating the premises necessary for participation of RoEduNet in the trans-European projects in data communications: GEANT2, SEEREN2, BSNet etc.;
- Guaranteeing the independent development of the RoEduNet network for at least 10 years by access to the fiber that is not under IRU (Indefeasable Right of Use) and by DWDM equipment (Dense Wavelength Division Multiplexing).

Operational sustainability:
From the point of view of data traffic services, the infrastructure is very important to all categories of researchers and teaching staff in the research institutions and universities, while from the point of view of very high speed communications channels it is very important to the GRID community.

Investment budget:	35 million Euro
Duration for accomplishing the investment:	36 months
Duration of use:	within obsolescence limits

1.2. GRID National Infrastructure for Research - RoReGI

Scientific field:
Information and Communication Technologies

Description:
The RoReGI project aims at organizing, implementing and operating the Grid research infrastructure in Romania, designed for the development and use of the high-complexity scientific applications, by ensuring the safe access of the virtual communities of users to the computing and memory resources they need, under conditions of viability, scalability, security and efficiency in operation. The Grid infrastructure will include high and middle-capacity Grid sites, along with specialized software (middleware), connected through the high-speed communications network for education and research and located in universities and research institutes that get benefit from these networks. The project is planned to develop in three sequential stages: (a) installation of high-capacity sites in localities where the main junctions of the RoEduNet high-speed networks are placed, in order to ensure their interconnection at 10Gbps (12 months); (b) implementation of the services for the operational management of the infrastructure at national level (4 months); (c) extension of the infrastructure (optional stage, dimensioned after a year of operation of the first section), by installing middle-capacity sites in correlation with the development of the high-speed network and with the dynamics of the requirements of use (12 months).

Justification:
- the need for the coordinated development of a national interest project, of high value and complexity;
- the need to ensure the professional administration of sophisticated computing configurations;
- the promotion of the Grid technologies in the academic and research environment;
- the need to comply with the policy of developing the electronic research infrastructure at regional and European level (support of the *European Research Area*), based on Grid national infrastructures.

Investment Impact:
- to produce a balanced infrastructure, based on active centers for competence in the field and on the reuse of the results obtained in the national and international co-operation;
- to develop and valorize the potential at national level, for the research and development in applications dependent on important processing and / or data memory resources;
- to facilitate the concentration of financial resources at the level of the beneficiary organizations on solving the problems specific to the field, and less on the continuous upgrading and administration of the IT infrastructure;
- to constitute at national level the virtual communities of users of the RoReGI resources;
- to increase the visibility and accessibility of the wide range of applications in the fields benefitting from the Grid infrastructure ;
- to ensure the premises for active participation in international scientific co-operation in these fields.

Operational sustainability:
Technically, the operation sustainability will be ensured by establishing and operating the National Operational Center and by implementing the regulations and responsibilities provided under the operational policy. Financially, the annual budget for operation and maintenance of infrastructure is evaluated to 4,14 million Euro: 2,24 milion Euro for large sites, 0,24 million Euro for the operation of the National RoReGI Center, 1,66 mil Euro for the middle sites.

Investment budget:	6,45 million Euro– for all 3 stages. (4,1 million Euro– for the first two stages)
Duration for accomplishing the investment:	30 months – for the total 3 stages (18 months – for the first two stages)
Duration of use:	within obsolescence limits

1.3. Center for research in advanced optical communications technologies and networks

Scientific field:
Information and Communication Technologies

Description:
The project aims to build a center for research/development/implementation of new technologies in data communications through optical fiber. This center is to be operated by an interdisciplinary team composed of specialists in computer networks and information technology, physicists, electronics engineers.

Justification:
The research center will develop technologies for very high-capacity optical fiber data communications increasing the current limits of the communications channels, knowing that, at this moment, maximum 10% is used, out of the total theoretical bandwidth of the optical fiber.

Investment Impact:
The infrastructure will contribute directly to:

- the creation/development/implementation of new devices for high-capacity optical fiber data communications – of tens and hundreds of bps, optical signal modulating and demodulating, dispersion and polarization compensators;
- the creation of a strong pole of research in order to diminish the differences between Romania and the European Union member states, and thus to actively contribute to the European and global scientific cooperation in leading fields;
- the development of communications infrastructure for education and research in Romania and the active involvement of Romania in the development of the GEANT network in the Eastern Europe and Black Sea area;
- Reviving research in Romania in the field of advanced materials with tunable electric and magnetic properties and in microwaves, as well as their application in telecommunications, by attracting young researchers.

Operational sustainability:
The center will provide the services for all categories of researchers and teaching staff in the research institutions and universities for the following fields: data traffic services, materials with tunable electromagnetic properties, high frequency electromagnetic and infrared optical field.

Investment budget:	4 million Euro
Duration for accomplishing the investment:	24 months
Duration of use:	within obsolescence limits

1.4. Center for research in information systems security

Scientific field:
Information and Communication Technologies

Description:
The electronic information, essential for the research in any field, as e-mail, documentaries, or any other form is more and more "jammed" by various "junk" packages inherent with the increase of the traffic speed on the internet. More and more, it is required to find better methods that filter the electronic information so that the interest information may be obtained by the one who asks for it. On the other hand, the development of the wireless technologies and the significant increase of the bands of connection on the internet have made the computer networks be more and more vulnerable at attacks, both from inside and outside. The project aims at the creation of an entity with RDI activity that should establish a set of procedures and provide information solutions that could be implemented at the level of every interested institution so that the transfer of electronic information between them would be completely secured and lacking interferences inherent to the use of public internet.

Justification:
The quantitative development of information systems at national level did not take into account as a major priority the component of information security. The accomplishment of a technical and regulating framework is strictly necessary for the institutional interoperability of the national entities and for normalizing the use of the information technology at national level.

Investment Impact:
The access to European and global RDI communities and resources, for instance the space programmes of the European Union and the European Space Agency – GMES, GALILEO, EO GRID – impose the implementation and compliance with specific standards of information security.
The center will develop the research activities necessary for the field and will provide the services necessary for the communities in the country, starting with the RDI community, in the form of regulations, policies, authentication, authorizations, training, support for value added services, expertise.
The activities of the center address to a large market, the services being useful both for companies and SMEs (small and medium enterprises) and for national and public institutions.

Operational sustainability:
The need for implementing these services at the level of both RDI entities and of service providers/ industry, is imposed by the rules that the products of the respective companies have to comply with, if they wish to remain "actors" on the market. The Center thus becomes also a supplier of paid services that, together with the

Investment budget:	Euro 700 000
Duration for accomplishing the investment:	12 - 16 months
Duration of use:	10 years

1.5. Unitary System for the Correlation of the Scientific and Encyclopedic libraries

Scientific field:
Information and Communication Technologies

Description:
The infrastructure consists in defining and achieving a national unitary system for the interconnection and management of all the scientific and encyclopedic libraries based on a network of specially designed data communications network. The system must ensure a minimal hardware/software infrastructure at the level of 40 info-documentary centers that may collect, organize and provide services to the various categories of users.
The achievement of the project assumes defining the procedures for making databases accessible online, in accordance with the national norms and regulations in the field. The project must define the principles and procedures for organizing and processing the documentary fund at the level of every info-documentary structure and the ways of interconnection within the network. The project will also establish the general conception of the entire network and its future development as well as the functions of every info-documentary center and of the central junction.

Justification:
- To create the premises for including the national system of libraries in the European initiative "European Digital Library".
- To reduce the effort necessary for the duplication/multiplication of cataloguing-indexation in parallel of the same document.
- Ensuring an easy and fast access to the documents purchased in the libraries available for the public, irrespective of the place the user is.
- Diminishing the "digital divide" phenomenon in the field of information and documentation, for the specialists who work in places other than large urban centers.

Investment Impact:
- The interested specialists and users will benefit from a unique interface of search, information and documentation regarding the resources existing in the libraries in Romania.
- The expertise in cataloguing-indexation-supply of modern services held by the experts in large libraries will also become accessible to the small libraries which do not have a specialized staff.
- The possibility to create a series of secondary products and services (bibliographies, inter-libraries lending services etc) at the level of the entire system.

Operational sustainability:
The development of the system interests both the personnel involved in library activities, as well as researchers/ specialists from various fields of activity. In this context, the libraries will ensure both the supply of data in continuous flow system and the development of services depending on the requests of the users. The maintenance resources can be ensured by the budgets of the universities, of the central and local administration organisations, of research–development institutions, where the respective info-documentary units are operating and which are interested in obtaining up-to-date information.

Investment budget:	3,7 million Euro
Duration for accomplishing the investment:	48 months (1st stage 2008-2010: conception, selection and equipment for network junctions, and creation of the central junction; 2nd stage, 2010-2011: commissioning of the system and its transferring to the operational stage
Duration of use:	incremental system, duration non-restricted

1.6. Unitary system for the inventory of research projects and results

Scientific field:
Information and Communication Technologies

Description:
The project proposes to define and accomplish a national unitary system for the management of projects and results of research so that the approach and the stage of achievement of the research in various fields of activity could be known at anytime. The system is based on a functional network in which all the public institutions that finance research in Romania should cooperate as well as all the entities that get benefits from public financing. The participating institutions have to ensure in a unitary structure both the description of the projects and the results obtained and have to provide the consistency and coherence of the data from their own databases. Te project will establish the general conception of the entire network and its future development as well as the functions of every participant in the system.

Justification:
- To create a national system of information on research activities and their results as decision support in establishing the policies and strategies regarding the scientific research in Romania.
- To ensure an easy and rapid access to information on the stage of accomplishment of the research in various fields of activity as well as on its results.
- To avoid the redundancy generated by parallel research.
- A better policy in the coordination and complementarity of various research activities.

Investment Impact:
- The interested specialists and users will benefit from a unique interface of search, information and documentation on the existing research projects.
- Creating synergies as a result of co-operation, facilitated by the access to relevant information on some similar or complementary research teams.
- Possibilities to create research consortia on various fields.

Operational sustainability:
Creation of the system interests both the personnel involved in research activities and the decision makers from various fields of activity. In this context, the system will ensure both a continuous flow of data supply and the development of services, depending on the requests of the users. The maintenance resources can be ensured by the budgets of the institutions that benefit from the research resources, as well as by the private or state companies that also benefit from the research outcomes.

Investment budget:	2,1 million Euro (estimated for the inclusion of 6 junctions in the system and for the development of the central junction that will ensure the system's management)
Duration for accomplishing the investment:	24 months
Duration of use:	incremental system, duration non-restricted

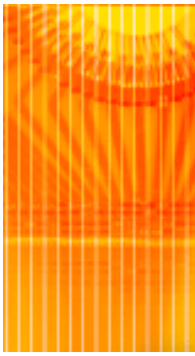
2. Energy

2.1. RD Platform for ecological fuels

Scientific field:
Energy

Description:
The biological fuels are fuels designed for transportation, obtained from organic materials. Nowadays, the best known biological fuels are bio-Diesel (obtained from vegetal oils), bio-ethanol (obtained from sugar, maize and other cereals) and bio-gas. Today the biological fuels play an important role in the national and European energy policies. They (bio-Diesel and bio-ethanol) are the sole immediate substitute for the oil used in transport, without changes or with minor changes of the means of transport, and are available on a large scale. They can ensure the shift to other energetic sources such as hydrogen, that has a huge potential. That is still far from being required on a large scale and will need major changes both in the construction of the transport means and in the distribution system. The RD platform for ecological fuels, mechanism through which all the interested actors (universities, research institutes, governmental bodies, producers and users) are brought together, must mainly aim at conducting new research activities in the field of biological fuels - bio-ethanol and bio-Diesel, hydrogen - production and storage, transport, and also for developing medium and long-term R&D strategies in the field, in close connection with the EU objectives.

Justification:
The diminishing of the global recoverable fossil hydrocarbon resources and successive increases of the price for the barrel of crude oil, as a result of the oil crisis, has created favorable premises for approaching other sources for obtaining fuels, that should ensure on one hand the security of procurement and on the other hand the energetic independence. The restrictive legislation related to the level of pollution of the environment, produced by the gases resulting from burning conventional fuels, also contributes to an accelerated pace for finding alternative sources of energy. Thus, dedicated European Technology Platforms were constituted: for Hydrogen and Combustion Cells in 2004, and for Biological Fuels, in 2006. As well, the following directives were adopted: the directive 2003/30/EC –on biological fuels; directive 2003/96/EC – on energy taxation; directive 2001/77/EC on the promotion of the electricity and products from renewable energy resources. According to the written declaration of the European Parliament of May 2007, the 5 key factors for energy independence are: increase of the energy efficiency by 20% until 2020; reduction of the global warming by reducing the greenhouse gas emissions by 30% until 2020; optimizing the marketing of renewable power sources (in 2020, 33% of the electricity and 25% of the total energy will originate from renewable power sources); concerning the biological fuels, in 2030 they will cover 25% of the fuel needs for road transport and 10% of the total necessary fuel.



Investment Impact:

- institutional construction and development of a research platform for ecological fuels, in close concordance with the objectives of European and national energy policies;
- establishing a national R&D strategy, in the field of ecological fuels, that should lead to the medium and long term achievement of the objectives of the Romanian energy and environmental policies and that should enable establishing a balance between the internal and imported production;
- accelerating the harmonization of the legislation and standards regarding quality and environment protection in the field of ecological fuels;

- improvement of the material resources for the development of the research platform integrated into the field of ecological fuels in order to achieve European standards for the entire range of necessary technological services (advanced conversion technologies, bio-refinery);
- increase of the professional competence of the personnel involved in research activities specific to the field of ecological fuels;
- dissemination and transfer of technologies, results and knowledge accumulated within the research activity regarding the ecological fuels, in order to increase the capacity of co-operation and partnership in the field, both at national and international level;
- promotion of the public – private partnership in the field.

Operational sustainability:

Ensured by:

- Creation of public-private partnerships for solving out joint research objectives and their application;
- Existence of research units and teams specialized in the field.
- Existence of ongoing projects for research and technological development of new types of ecological fuels, financed from 2nd National Plan for RDI for 2007-2013.
- Existence of investments projects under development, for biomass fuels production (Slobozia, Arad).
- Ensuring the necessary amount of energy crops, through diversification and increase of the share of energy crops in total crops, in compliance with the provisions of the "Romanian Energy Strategy for 2007 - 2020".

Investment budget:	3 million Euro
Duration for accomplishing the investment:	36 months
Duration of use:	10 years

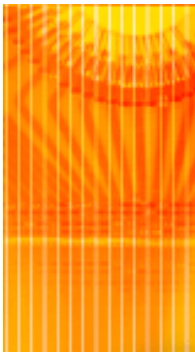
3. Environment

3.1. Institute for Research-Development in ecological reconstruction of the environment

Scientific field:
Environment

Description:
The project's main objective is to create a specialized infrastructure, supplying the high technical and scientific competence and expertise needed in the field of ecological rehabilitation of land, damaged by pollution with organic and anorganic pollutants or degraded as a result of the surface mining exploitations or emissions from thermal power plants. The project proposes the establishment of a center capable to develop and diversify high performance transdisciplinary research, oriented towards solving out complex problems, and/or applying policies, of socio-economic development. The institute would deliver the following services: development and transfer of technologies related to the ecological reconstruction of the environment for the landowners dealing with problems related to the pollution of soil, irrespective of the form of property; accomplishment of a consultancy system for the farmers, owners of contaminated lands and companies with activities that generate pollution; defining and monitoring the area affected by pollution (crude oil, mineral oil products and other groups of organic and inorganic contaminating agents), development of specific technologies for depollution of the contaminated soils; regulation of the way the various depollution technologies are applied; regulation of the way the depolluted soils are undergoing ecological rehabilitation; connection to similar European infrastructures.

Justification:
The big differences in treating the issues related to the depollution of contaminated soils, at European and, respectively, at Romanian level, require urgently the development of a project that should strengthen the scientific and technical basis in sustaining and applying depollution technologies in Romania. Taking into account the recent legal acts issued by the Government of Romania, Government Decision no. 1408/ 19th of November 2007 on the modalities of investigation and evaluation of the soil and subsoil pollution and Decision no. 1403/ 19th of November 2007 on the rehabilitation of the areas where the soil, subsoil and the terrestrial ecosystems have been damaged, large amounts of information will be needed by the Central Public Authority for Environment Protection. The new European Directive for Soil Protection also imposes norms for which the necessary equipment does not exist in our country for the time being.



Investment Impact:
The main beneficiaries of this highly specialized infrastructure could be: the farmers, owners of contaminated lands and the companies active in oil industry.
The private companies specialized for interventions on soils polluted with crude oil and mineral oil products will benefit from highly qualified technical assistance during the process of soil remedy.

Operational sustainability:
The transdisciplinary scientific research developed by the institute will represent the basis for promoting sustainable development programmes, will supply scientific and operational arguments for developing an integrated system for the management of the complex relations between socio-economic actors and the environment subject to anthropic pressure, will create instruments and procedures for assessing and reducing the impact of human activity on the environmental factors and for restoring the natural balance, prior to polluting phenomena. The sustainability of the infrastructure is also motivated by the necessity of permanent reporting to the European Community on the quality of land in Romania.

Investment budget:	14,7 million Euro
Duration for accomplishing the investment:	60 months
Duration of use:	20 years

3.2. « Danube Delta » International Research Center

Scientific field:
Environment

Description:
According to the Decision no. 1905/10.08.2006 of the Local Council of Murighiol Village in the Delta of Danube, an area of 10 hectares of land, free of charge, was made available for setting-up an international center for biology research.
The new research unit, unique in the country due to the research profile and the conditions that will be offered, will ensure the multidisciplinary activity of researchers from numerous institutes, education units, national and international non-governmental organizations. The RD programmes that will be carried out in the center will ensure the core-support for the development of scientific co-operation relations with countries of the European Union, of the Black Sea Economic Cooperation Initiative, and with other international bodies.

Justification:
The creation of the center is largely imposed by the fact that the anthropic pressures in the last 30-40 years associated with the natural vulnerability of the Black Sea basin led to a decline of the environment quality and an increased pollution degree in the Danube Delta area. Therefore, it is required to create the possibility to carry out on site thorough studies on the Delta's current condition and to prepare specific protective measures for the ecosystems in this area.

Investment Impact:
The infrastructure will be conceived for developing multidisciplinary activities in the field of life sciences, in order to attract valuable researchers from the national and European/international space, especially from the countries from the Danube riverside, having in view:

- development of co-operation and a greater involvement of the research community in multidisciplinary and transdisciplinary research, at national and international level,
- protection of national natural patrimony,
- sustainable management of natural resources,
- promoting and valorising the use of non-conventional energy sources, with reduced impact on the environment.

Operational sustainability:
The center will ensure a modern infrastructure where multidisciplinary activities of scientific research, under- and post-graduate training, on site exchange of information between specialists of different countries, summer schools, thematic meetings, workshops will develop simultaneously and permanently.

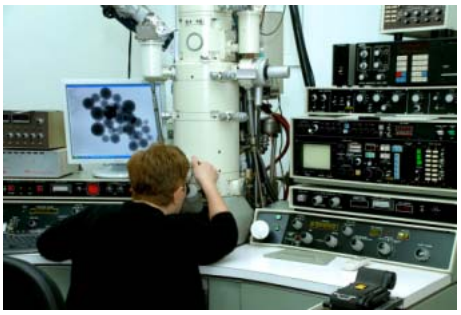
Investment budget:	39,3 million Euro
Duration for accomplishing the investment:	48 months
Duration of use:	within obsolescence limits

4. Physics

4.1. Institute for Surface and Interface Science

Scientific field:
Physics

Description:
Institute for Surface and Interface Science (ISIS) represents an autonomous research entity, constituted in order to create the conditions of an interdisciplinary partnership between research institutes from certain areas of the country, having already important results in the field. This institute will monitor the development of knowledge in this priority field at world level – surfaces/interfaces science. ISIS will have laboratories specialized for: (a) preparation of thin layers and interest surfaces for priority fields as biophysics and molecular biochemistry, nanoelectronics and microelectronics and others; (b) their characterization from the point of view of the structure, topography, chemical composition, electric and optic properties, using techniques of difractometry of X-rays and electrons, electronic microscopy, AFM/STM, spectrometry of electrons, ions and X rays, UV-Viz-IR spectrophotometry, Raman, elipsometry; (c) modification of surface by plasmochemistry methods, electronic/ionic bombardment. In the initial stage of the project as well as during its development, the partners will have the possibility to make available for the institute a series of equipment related to the surface/interface science.



Justification:
The research activity will follow the investigation of the fundamental processes of surface/interface, as well as valorizing the outcomes by transfer of technology towards the beneficiaries in the economic sector and academic field, scientific publications etc. Specialists are to be trained in the following fields: (a) surface changes and their analysis; (b) production of advanced materials with catalytic interest for environmental protection; (c) improvement of techniques for modelling and simulating surface and interface phenomena.

Investment Impact:
ISSI will concentrate and train specialists in order to generate knowledge, with fundamental and applicative character, for scientific and economic entities, by formation and development of Romanian competencies in the field. This will allow the integration of the graduates in the field of natural science or engineering, facilitating the return to the country of the Romanian researchers from abroad. ISSI will integrate into the European research network in the field of surface and interface science. The institute will promote the co-operation with international prestigious institutions, starting from existent research/academic partnerships. ISSI will initiate and support links with industrial partners from the area where it will be located, as well as with other economic agents from the country or abroad, that are interested in the implementation of innovative technologies. The Investment Impact will be felt rapidly in the fields of advanced materials, environmental protection, generation of clean energies, biophysics, health, food and chemical industry, electrotechnics etc.

Operational sustainability:
ISSI will provide services for training and developing techniques for the characterization of the materials for partners of the academic and economic field, science and technology parks. It will offer the material resources and the expertise in order to host research activities for master and doctorate students. In the first stage, the partner institutions will make available for the institute the human and material resources they have, in order to stimulate the quick start of research and transfer of technology.

Investment budget:	20 million Euro
Duration for accomplishing the investment:	24 months
Duration of use:	within obsolescence limits

5. Health

5.1. Institute for research in biosystems and pharmacogenomics

Scientific field:
Health

Description:
(1) The institute is viewed as an advanced, complex biotechnological research structure, with highly qualified human resources, necessary in order to set up, support and operate an unit for the research of life and of the human body, seen as an integrated and interactive network of genes, proteins, biochemical reactions, cells, development processes, structural and operational units and their emerging properties, whose perturbation generates the disease. (2) It is also viewed in the context of fundamental and applied research designed for the understanding of the structure, dynamics, adjustment of biosystems, for conceiving new biotechnologies, commuting the reactive medicine towards a predictive and preventive medicine. The population health will be assessed by measuring the fundamental molecular and biochemical factors in order to understand the current pathobiologies, changes occurred in health patterns and to introduce personalized treatments based on the genetic imprint. (3) Promotion of the pharmacogenomics by examining the way the genetic fingerprint affects the answer to diverse treatments, by combining traditional pharmaceutical sciences with the understanding of variations and human genome polymorphism, by personalizing the medical prescription.

Justification:
Development of research on health, creation of founding premises of a synergetic research environment by uniting various types of expertise of the scientific community members into a transdisciplinary combined resource capable to amplify the individual performances, to create opportunities for promotion of advanced research technologies, including the discovery of new medicines, to generate highly qualified human resources and integration into the European networks of consortia and education and research programmes.

Investment Impact:
- Creating the infrastructure, developing human resources necessary for the research activity in the fundamental fields of biosystems and applicative fields of pharmacogenomics;
- Promoting, stimulating, assisting and encouraging the development of scientific and technological capacities at regional level in the above-mentioned fields;
- Operating as regional pole for contact/dissemination of information and knowledge in biosystems and pharmacogenomics;
- Supply for the internal industrial partners in order to benefit from biotechnology products derived from the research activity, thus recovering the investments made in the research;
- Promoting the co-operation with external partners, including industrial partners, for increasing the visibility at European and international level of the biomedical research conducted at regional level.

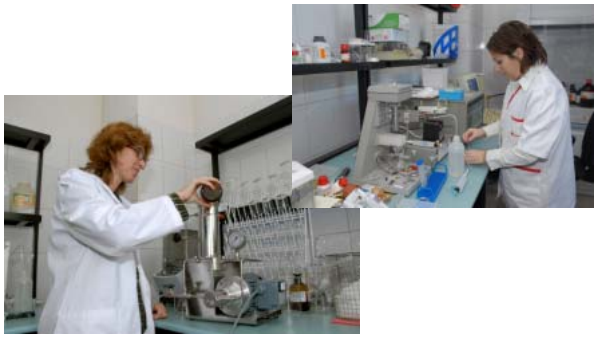
Operational sustainability:
Development of an infrastructure with critical importance at regional level, capable to compete successfully in international research programmes, to generate profitable links to economic environment in view of creating a favourable climate for attracting the Romanian and/or foreign specialists, for creating new jobs and preventing the emmigration of young graduates, for maximizing the intellectual property benefits, accelerating the production of new medicines and facilitating the clinical studies.

Investment budget:	20 million Euro
Duration for accomplishing the investment:	36 months
Duration of use:	within obsolescence limits

5.2. Romanian Center for biomolecular research applied in infectious diseases

Scientific field:
Health

Description:
The infrastructure will comprise research laboratories allowing the identification of new pathogene agents that cause disease to people or of co-infections that may be responsible of severe diseases potentially lethal.
Development of such laboratories is required since there are many diseases that do not have a specified ethiology and which are probably caused by a series of germs (for example: duodenal ulcer presently recognizes an infectious ethiology and is treated with antibiotics, cervical cancer– recognizes (more than 86%) a viral ethiology and can be prevented by specific vaccination).
The infrastructure must sustain a series of flows and functions specific to: hematology, bacteriology, immunology and virology, molecular genetics, cell cultures and a system for the isolation of the patients with diseases with major epidemiologic risk for population (ex.. hemorrhagic fevers, SARS, avian flu etc.).
This laboratory system must be developed in synergy with the part of laboratory diagnosis already existing at the level of the public health system.



Justification:
The setting up of the Center is justified by the current complex status of the infectious diseases at international level shows the emergence and the reemergence of the infectious-contagious diseases (SARS, avian flu etc.), fact associated over the last period with bioterrorism elements, which has led to drawing up some plans of emergency measures, (ex: problems of the infectious diseases).

Investment Impact:
The impact of this new structure will be transposed in three different activity plans:

- isolation and identification of new infectious agents;
- supervising and monitoring the evolution of infectious-contagious diseases, from Romania and from the region;
- development of individualized therapeutic solutions and strategies of public health, in terms of prophylaxy and care, in an integrated system– national and European.

Operational sustainability:
Creation of a system that represents an interest for researchers/specialists, personnel involved in research activities in the field, as well as staff of other research-development institutions/fields of activity or structures of central and local administration interested in obtaining the up to date information in the field.

Investment budget:	49 million Euro
Duration for accomplishing the investment:	24 months
Duration of use:	within obsolescence limits

6. Agriculture, food safety and security

6.1. Center for research in quality and competitiveness of foodstuffs

Scientific field:
Agriculture, food safety and security

Description:
The project has in view the structural and functional organization of a center for research in quality and competitiveness of foodstuffs that will carry out research activities as well as consultancy and professional training activities, materialized in experiments in pilot plants, laboratory analyses in new research fields and dissemination activities: courses, seminars, workshops, conferences.

Justification:
The present status of the infrastructure and the special requirements imposed for the quality of foodstuffs require: constructing and equipping the laboratories on new subfields: sensor-based analysis, colloidal biochemistry, nuclear magnetic resonance, quality of fermentative processed vegetables and fruits; constructing and equipping pilot plants for: extruded-expanded flour products, processing of vegetables– fruits and meat; construction and endowment of a department of interdisciplinary research; elaboration of studies for sustaining the public policies in the field.

Investment Impact:
The project will increase the quality and efficiency of RD activities in the field, due to the establishment of a stimulating research environment, at European level, attractive for Romanian and foreign students and candidates for doctor's degree. The center will determine the increase in competitiveness of Romanian food industry, by research and innovation, due to the increase of professional competence in the field and to the stronger co-operation with industrial partners. The third impact direction has in view the theoretical and practical training of the specialists in industry.

Operational sustainability:
Annual costs for project operation: 1st year – Euro 5642 thousand; 2nd year – Euro 5642 thousand;
The costs for operational sustainability will be: in total Euro 888 thousand /year, meaning Lei 3085 thousand, of which: utilities – Lei 225 thousand; raw materials – Lei 2000 thousand; telecommunications – Lei 80 thousand; consumable materials – Lei 380 thousand; marketing and advertising – Lei 400 thousand.

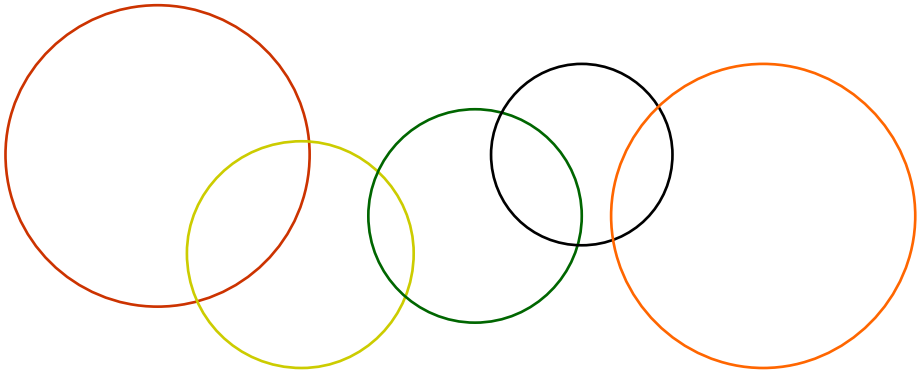
Investment budget:	9,2 million Euro
Duration for accomplishing the investment:	24 months
Duration of use:	within obsolescence limits

6.2. Technical basis for the modernization of the genetic resources in cereals and technical plants

Scientific field:
Agriculture, foods safety and security

Description:
For the modernization of the research on the improvement and diversification of genetic resources in cereals and technical plants, it is necessary to supplement and renew the existing material resources with:

- equipment for experimental fields, in order to increase the volume of biological material under research;
- equipment and plants for controlled climate, to carry out physiological tests on the resistance to climatic stresses and on the acceleration of genetic progress by obtaining additional generations;
- laboratory analytical equipment for quality tests, physiological tests, and molecular genetics analyses.



Justification:
It is necessary to modernize the technical basis in order to increase the capacity of the Romanian research to supply biological materials adapted to the soil and climate conditions in Romania, and competitive at European level, aiming the quantitative and qualitative increase and stability of the agricultural crops, in the context of the climatic changes and preoccupations with production of sufficient quantities of healthy foods and fodders.

Investment Impact:
The investment in modernization of the technical basis for improvement of the genetic resources in cereals and technical plants may have a significant impact, immediately and in the long term, on the production, stability of crops, technological quality and effect on the human health, for crops cultivated on 70%-90% of the tillable area of Romania. A similar investment made in 1970 -1971 in Romania from FAO funds ensured the international competitiveness and integration of the research carried out here and permitted a leap in the value of the genetic resources supplied to the Romanian agriculture.

Operational sustainability:
To valorize the modernized technical basis efficiently it is necessary to cover some annual additional operational costs of 120000 Euro (energy costs for controlled climate– Euro 60000, material costs – Euro 50000 and maintenance costs – Euro 10000) that could be supported from the projects in progress.

Investment budget:	1,5 million Euro
Duration for accomplishing the investment:	9 months
Duration of use:	15 years

7. Biotechnologies, biology and genetics

7.1. Platform for research in biotechnology

Scientific field:
Biotechnologies, biology and genetics

Description:
The platform for research in biotechnology will be constituted as a representative center at national level for research activities and technological development in the field of biotechnology. At the same time, the institute will ensure permanently a diversified platform for research activities specific to higher education in biotechnology, agriculture, food and medico-pharmaceutical fields. The main research directions will be: biotechnology in agriculture, including the veterinary field, biotechnology applied to the medico-pharmaceutical field, food biotechnology and biotechnology for environmental rehabilitation.

Justification:
Biotechnology represents a priority research field at national level, with immediate industrial applications, so that its development in Romania constitutes an important interest and advantage under the circumstances of accession and integration into EU. At present, our country has an important research potential in the biotechnology field, represented by specialized compartments within the research institutes, as well as by faculties with biological sciences profile. Creating a research facility dedicated to this field, will ensure an internal viable source of high level competence in a lead technology field, that could offer specialized scientific and technological services and could develop sustainable partnerships with beneficiary industries.

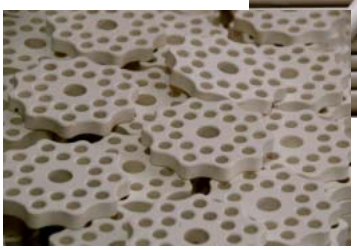
Investment Impact:
The establishment of the national platform for biotechnology will constitute a real basis for the training of the specialists in biotechnology field at European standards and a real and necessary premise for the development of biotechnology research in Romania. The pilot plants for demonstrative micro-production within the institute are vital to the development of the Romanian applied research in this field and will allow testing the technologies and the rapid transfer of the results obtained towards the productive sector of the real economy.
As regards the human resources, the setting-up of the institute assumes finding and development of some interdisciplinary or multidisciplinary competencies. This aspect determines, obviously, a greater complexity of the entire activity but also allows the increase of the capacity for adjustment and learning efficient work methods, thus ensuring a greater durability of the project.

Operational sustainability:
The operational sustainability will be ensured by:

- participation and co-ordination of some complex research-development projects, at national and international level, as well as of some research programmes and /or sub-programmes at national and international level;
- fast identification and valorization of opportunities generated, at national and international level, by the favourable evolution of the biotechnology market.

Investment budget:	20 million Euro
Duration for accomplishing the investment:	34 months
Duration of use:	over 30 years

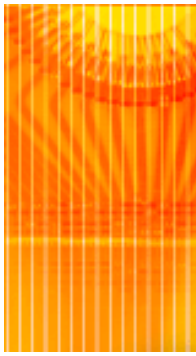
8. Innovative materials, processes and products



8.1. Open laboratory for the synthesis, testing and assessment of nanostructural composite systems and biocompatible hybrid systems

Scientific field:
Innovative materials, processes and products

Description:
The infrastructure being proposed consists in setting-up a laboratory open for doing research on the synthesis and experimentation of nanobiomaterials for regenerative medicine and tissues engineering. By modernizing the research infrastructure and purchasing modern equipment for synthesis and experimentation of nanobiomaterials, within an open laboratory, research and testing methodologies will be developed, selected and validated in accordance with the European requirements. The facility will be accessed by researchers, university staff and specialists of SMEs. The laboratory will provide training and technology transfer activities, virtual access to the jointly developed database.
The research will be oriented towards top directions through laboratory and pilot-scale synthesis of some new types of metallic, ceramic, composite and hybrid nano-bio-materials in specific sterility conditions – D class, through characterization of the mechanical, thermal and chemical properties. The laboratory will provide samples for in vitro and in vivo tests, thus promoting co-operation with institutes of biology and technology transfer to SMEs.



Justification:
- The innovative materials priority established by the National Strategy for RDI for 2007- 2013
- Strategy of the Ministry of Economy and Finances in the field of medical apparatus and devices
- Strategy for regional development developed by the Agency for Regional Development Bucuresti-Ilfov
- European Union 7th Framework Programme – Thematic Directions Nanomaterials and Health
- Participation in the development of the European Technology Platform for Nanomedicine

Investment Impact:
- Development of the infrastructure and the existing research and testing facilities in order to allow carrying out fundamental and industrial research in compliance with the world tendencies in the field;
- Homologation of innovative technologies, ecological technologies with reduced energy consumption;
- direct and virtual access to developing, testing and validating new nano-bio-materials as well as the continuous professional training of the personnel in the companies that produce or distribute biomedical materials and devices
- Creation of a national platform and a database integrated into ETP for Nanomedicine
- Development of SMEs in high technology fields such as nanobiomaterials, development of new market niches for these ones, efficient use of the internal sources of raw materials and materials;
- Increase of the number of high qualification jobs and employment of young graduates.

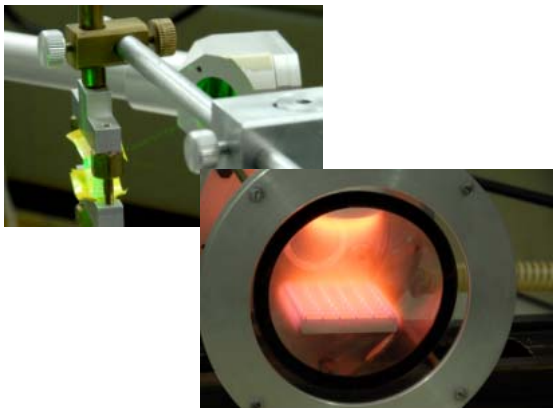
Operational sustainability:
The investment will be supported by:
- Interoperability with existent experimental and information basis
- Expected increase of the interest and number of direct contracts with SMEs in the field.

Investment budget:	4 million Euro
Duration for accomplishing the investment:	36 months
Duration of use:	10 years

8.2. Center for advanced research in robotics and integrated micro- nanomechatronics

Scientific field:
Innovative materials, processes and products

Description:
The proposed project promotes the establishment and development at national level of a new research institution that pursues the concentration of RDI activities and the activities related to them, in the field of integrating the concepts of robotics and mechatronic micro-nanosystems / nanosystems — CETRONIC, to allow the initiation of national and international scientific partnerships, to stimulate the technological transfer, to encourage the request of innovation and to participate to international projects in European and wider international context. Through its specific research objectives, the proposed infrastructure favours the disclosure of new frontiers of scientific knowledge and its transformation in integrated applications, with high degree of intelligence and information, for leading edge and emerging fields, in accordance and complementarity with the European capacity for (industrial) robots, micro-nanosystems, micro-nanotechnologies, and based on an open access policy for the entire mass of users. The data on the use of the infrastructure will be widely disseminated.



Justification:
Due to the envisaged scientific field and to the orientation towards advanced research, in full compatibility with the external scientific environment, and also intended to serve a large number of users, presents a major interest, both as a national facility and at regional level. CETRONIC configures and materializes a long-term scientific, technical and financial vision. The relevance and the operational potential of the center justify, by proportionality, the volume of the investment and ensure large availabilities regarding the dissemination of the results.

Investment Impact:
At national level, CETRONIC will develop large complexity interdisciplinary and transdisciplinary activities in leading edge and emerging fields of research. CETRONIC will distinguish itself through the innovative character of the research, the integrative and institutional conception based on the development of advanced research with themes specific to the national and international RDI programmes. The results of the research activities within CETRONIC entail an increased potential of use intended for a large critical mass of users that will be amplified due to connections with the national system for human resource training. The impact will be ensured by extending and supporting the access to the new infrastructure through local facilities, with regional and zonal distribution, in virtual perspective. CETRONIC will develop itself as RDI entity in logical and functional connection of complementarity and sustainability with other advanced multidisciplinary research compartments of the infrastructure for research.

Operational sustainability:
Monitoring the integration of the structural synergies of the research fields concerned and aiming the conception, development and implementation of (industrial) robots, "high–tech" mechatronic micro-nanosystems, CETRONIC targets a wide variety of potential beneficiaries and users. The expertise in the field, valorised through short and medium-term implementation, allows the compatibility with similar functional infrastructures at European and international level.

Investment budget:	1,5 million Euro
Duration for accomplishing the investment:	30 months
Duration of use:	7 years

9. Space and security

9.1.Platform for research, testing and assessment for terrestrial, air and naval security and defense systems

Scientific field:
Space and security

Description:
The project aims at the constitution of a platform for research, testing and assessment in order to ensure:

- The research capacity necessary to carry out new technical solutions in order to satisfy the national research needs in the field;
- testing and assessment of all categories of products in the terrestrial, air and naval field, newly fabricated or modernized in the country or abroad;
- carrying out measurements for the parameters of the acoustic field produced by different radiation sources: surface ships, sonar systems, machines and mechanisms on board ships etc.;
- the detection, classification and identification of the subaquatic objects generating security risks, for ensuring the interoperability;
- evaluation of the electromagnetic radiation of the electrical and electronic equipment that is to be installed on board of ships, in accordance with the specific applicable standards;
- increase of the defense and intervention abilities in NBC field, in case of accidents or terrorist-subversive events;
- identification of new cryptographic algorithms, cryptanalysis methods and statistic tests, technologies for development and testing of equipment, system integration and operational tests.

Justification:

- Implementing the NATO priorities in the security and defense field (protection against terrorism – DAT-1) GD 2080/2004 and GD 556/2001 ("Systems and technologies for protection against terrorism of any kind" and "Conducting research and experimenting techniques and technologies and development of pilot-systems for the protection of terrestrial, marine and aerial borders").

Investment Impact:
The objectives being proposed will lead to obtaining an infrastructure that provides increased capacity to respond to the research-development demand of national institutions with responsibilities in the security and defense field. This infrastructure will also provide new perspectives for participation in the EU 7th Framework Programme, NATO R&D programmes, NATO work groups, debates of the Research and Technology Organization and the European Defense Agency. The infrastructure will develop the capacity to also participate in other international research programmes.
Completion of the platform will have a significant impact at national level (by supplying information, data and analyses in the fields that are very sensitive from politically and military point of view), at regional level (by developing capacities of co-operation with similar military structures from the Black Sea area) and at international level (by co-operating with other research units from other countries).

Operational sustainability:
The project proposal presents interest for the entire National Defense System, as well as for the civil sector. The project aims at the modernization of some existing infrastructures and at modern research equipping, under supervision of a team of highly qualified researchers. The operation costs are covered from own incomes.

Investment budget:	12 million Euro
Duration for accomplishing the investment:	24 months
Duration of use:	15 years

10. Social and economic and humanistic research

10.1. National institute for the scientific investigation and protection of the cultural patrimony

Scientific field:
socio-economic and humanistic research

Description:
The National Institute for the Scientific Investigation and Protection of the Cultural Patrimony will represent a scientific entity for training specialists in the field of the protection of the national and universal cultural patrimony, under co-ordination of a University or a consortium of Universities. The main objective is to increase the capacity of innovation and technological development in scientific investigation and integrated preservation of the cultural goods. The Institute's mission, with regional, national and cross-border opening, will be to develop new methods for scientific investigation, preservation and protection of the cultural patrimony goods, to provide specialized assistance for the sector bodies in fighting against the proliferation of forged goods and illegal trade with patrimony goods, to provide interdisciplinary training for young specialists through master, doctoral and post-doctoral programmes, in order to constitute a group of experts in cultural patrimony, with European recognition, as well as to integrate the scientific research and higher education in Romania into the European research and training structures.

Justification:
Creation of this national institute within a University is justified by the existence therein of excellence centers, platforms for interdisciplinary research and research laboratories in the field of investigation and protection of the cultural patrimony, acknowledged by CNCSIS, by the existence of a group of professors and expert researchers, nationally and internationally recognized, by the existence of interdisciplinary educational programmes in this field at all levels - lycense, master, PhD studies.

Investment Impact: **locally**- investigation and protection of the cultural patrimony of areas like Cluj, Iaşi, Timişoara or Bucharest; participation in the preservation and restoration of the laic or ecclesiastic historical monuments in these cities; **regionally**- investigation and protection of the cultural patrimony in the regions of Moldova, Transylvania, Banat or Muntenia; participation in the preservation and restoration of the historical monuments in these historical regions, particularly those monuments included in the UNESCO list and the national List of Historical Monuments; **nationally**- participation in the National Restoration Programme, approved by the Ministry of Culture and Cults; participation in fighting against the proliferation of the forged goods and the illegal trade with patrimony goods on the Romanian territory; **cross-border** – participation in fighting against the proliferation of forged goods and the illegal trade with patrimony goods at the border between the community and extra-community space; investigation and protection of the cultural patrimony from the neighbouring regions with Romanian population (Basarabia, Northern Bucovina, Serbian Banat etc.). By setting-up this institute in a university center like Iaşi, Cluj or Bucharest, that university will get benefit from a modern institution for the protection of the cultural patrimony.

Operational sustainability:
After implementation of the project, the National Institute for the Scientific Investigation and Protection of Cultural Patrimony will offer a large series of products and services for protection of the cultural patrimony belonging to various regional, national or even European cultural, religious and economic entities, that will support the long term activity of the Institute. The Institute will also participate together with its partners in different national and European projects and programmes for the salvation of both the mobile and the steady cultural patrimony.

Investment budget:	20 million Euro
Duration for accomplishing the investment:	36 months
Duration of use:	within obsolescence limits

Annex 1

List of research facilities of national interest – 2007

List of the facilities and objectives of national interest financed from the funds of Ministry of Education, Research and Youth – NASR in accordance with the Governmental Decision no. 1428/2004 (Official Journal 277 of 30th of March 2004):

No.	Name of national interest facility	Name of the research-development unit that administrates the facility
1.	VVR-S Nuclear rector for research and production of radioisotopes	„Horia Hulubei" National Institute of Research-Development for Physics and Nuclear Engineering– I.F.I.N.–HH Bucharest
2.	Radioactive waste treatment and storage plant– STDR	
3.	National radioactive waste repository -DNDR	
4.	TANDEM Linear acceleration system –Post-acceleration – TPA	
5.	Cyclotron Accelerator	
6.	Multiple-purpose irradiation facility	
7.	National seismic network (seismographic stations with local registration, radio-telemetered stations, analogical (SMA11) and digital (K2) accelerographs network	National Institute of Research-Development for Earth Physics - I.N.C.D.F.P. Bucharest
8.	Laboratory – National Data Center (CTBT- Treaty on total prohibition of nuclear experiments)	
9.	Experimental pilot plant for the separation of the tritium and deuterium	National Institute of Research-Development for Cryogenic and Isotopic Technologies – I.C.S.I. Râmnicu Vâlcea
10.	Electrons Accelerator (betatron, linear accelerator, microtron)	National Institute of Research-Development for Physics of Lasers, Plasma and Radiation – I.N.F.L.P.R.
11.	Magnetic dense plasma plant	
12.	System for production, measurement, registration of the short circuit currents	Institute of Research and Design for Electrical Machines, Transformers, Electrical and Traction Equipment - ICMET Craiova
13.	„Mare Nigrum" Multidisciplinary marine research ship	National Institute of Research-Development for Marine Geology and Geoecology "GEOECOMAR" Bucharest
14.	"Surlari" National Geomagnetic Observer	National Institute of Research-Development for Geology, Geophysics, Geochemistry and Teledetection-IGR Bucharest
15.	National Geologic Museum	
16	Photoemission Spectroscope (XPS)– VG- ESCA	National Institute of Research-Development for Materials Physics - Bucharest
17.	Laboratory animal farm -ANIMALERIA-SPF	„Cantacuzino" National Institute of Research-Development for Microbiology and Immunology
18.	Laboratory of high-speed aerodynamic experiments - Trisonic Supheria and Ludwig tube	"Elie Carafoli"-National Institute for Aerospace Research INCAS
19.	Laboratory of low speed aerodynamic experiments – Subsonic Sulpheria	

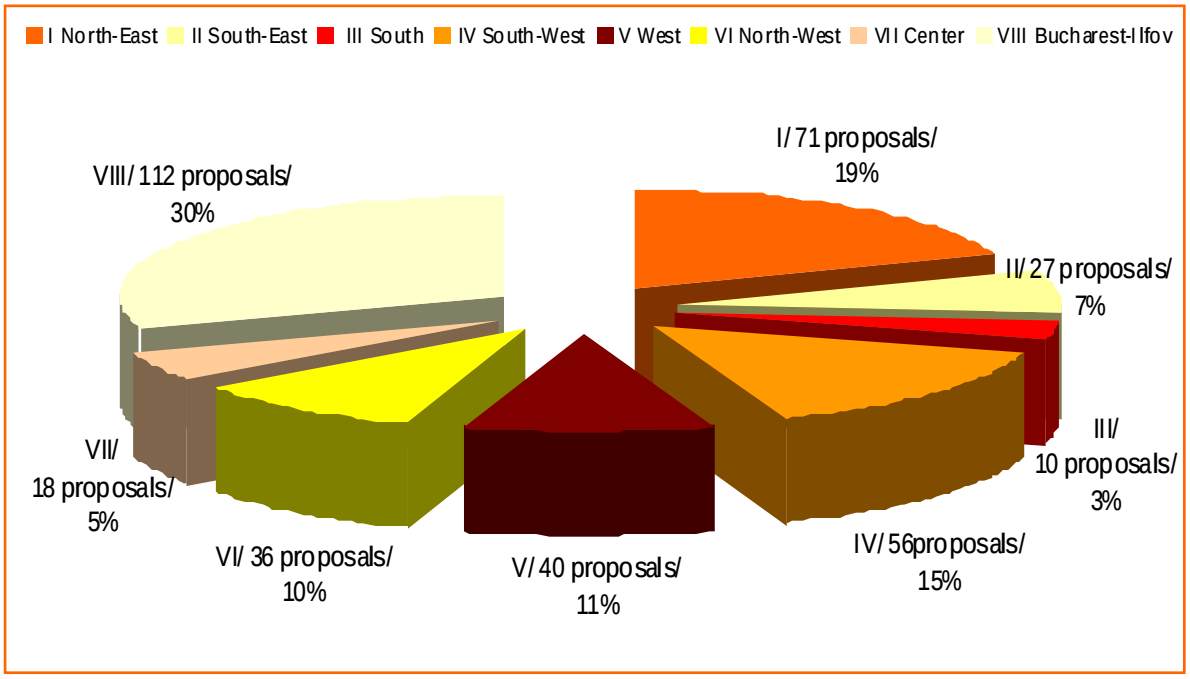
Annexe 2

Proposals prepared under the IMPACT programme (sessions 1-4)

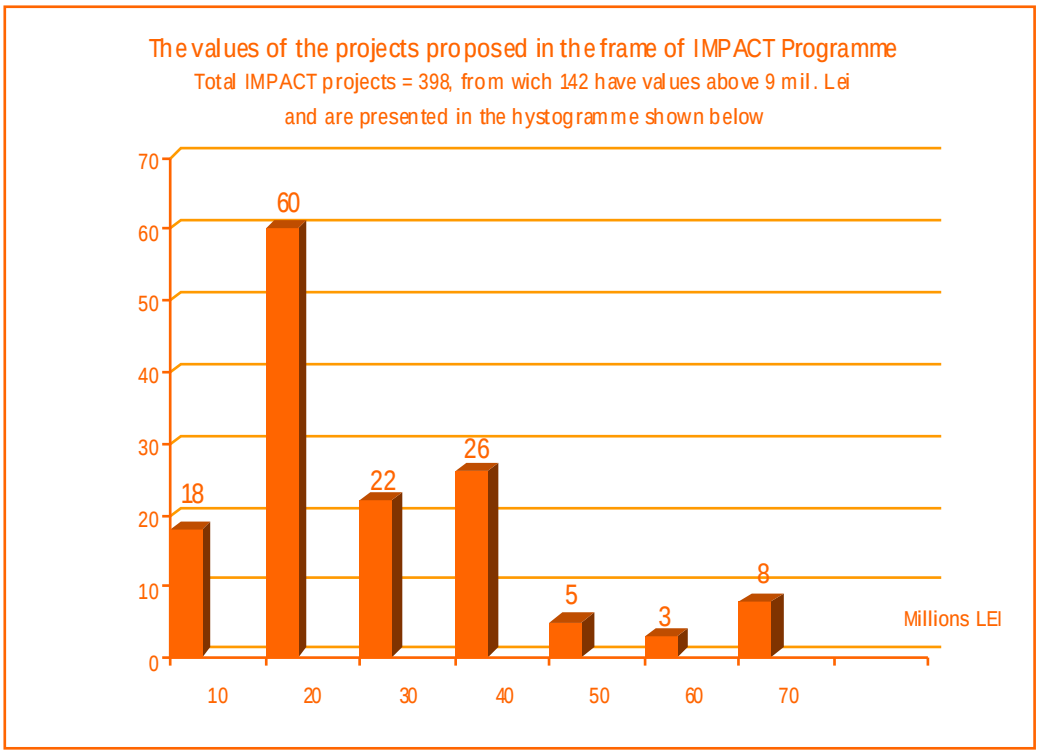
The IMPACT Programme coordinated by NASR aims to develop the portfolio of project proposals to be further submitted to the Sectoral Operational Programme for the increase of the economic competitiveness (POS-CCE) Priority Axis 2 "Competitiveness by research, technological development and innovation".
Four sessions of the IMPACT programme were carried out until November 2007.

After the first four IMPACT sessions, feasibility studies for 398 proposals were conducted or are to be completed for operation 2.2.1 aiming the public research infrastructure. 265 proposals have values ranging between 2 and 9 million Lei and 142 proposals have values of over 9 millions Lei, according to the request for financing submitted to IMPACT.

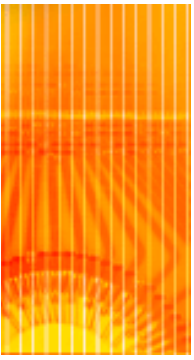
The distribution by regions of these 398 proposals is shown in the following:



For those 142 proposals of over 9 million Lei (coming from 88 institutions), the histogram looks as follows:



18 proposals have values between 9 and 20 million Euro. 8 proposals have values over 60 million Lei.



ANCS
21 - 25 Mandolacv st., 010362, Bucharest, Romania
Telephone: 40 21 319 23 25, 319 23 22, 319 23 35
http://www.ancs.ro http://www.cercolaic.ro