REPUBLIC OF ALBANIA

SCIENCE, TECHNOLOGY AND INNOVATION NATIONAL STRATEGY 2009 – 2015

FINAL DRAFT

June 2009

TABLE OF CONTENT

Foreword

Distinguished readers,

I have the pleasure to present the Science, Technology and Innovation Inter-sectoral Strategy (STIS), the first document of its kind, which shall constitute the long term research and development platform in our country, for the period 2009-2015.
Albania's high rate economic and social development, coupled to the progress achieved in the process of NATO and European Union integration, render indispensable the strengthening of the role of science, technology and innovation. The latter constitute the fundamental principles of an insight-oriented economy, and are essential to facing up to the great challenges awaiting us in an ever more competitive global world. This strategy clearly establishes the vision, as well as a series of important objectives related to funding and human resources that shall engage in achieving its aims, which are in tune with the objectives of the Development and Integration National Strategy, with the objectives of the Higher Education Strategy (HES), as well as other sectoral strategies. This strategy is a clear indicator of the current government's engagement to place research and science, along with higher education, under the focus of government priorities. The STIS, along with its Action Plan, constitute a valid guide for the efforts of policy-makers, universities, academicians, and all Albanian researchers contributing in accomplishing objectives and activities during its implementation. On this occasion, I wish to express my heartfelt gratitude to all who contributed in drawing the strategy, the staff of the Ministry of Education and Science, the Strategies' Correlation and Foreign Aid Coordination Department, universities and academicians, specialists of related ministries and other agencies, who enabled the collection of information and offered their extremely valuable comments and suggestions. A special acknowledgment goes to the BRESCE/UNESCO directors, staff and experts, who provided technical and financial assistance for drawing this document.
While appraising the approval of this strategy as an important step ahead, we are conscious of the great amount of work needed for its implementation. Thus, I invite all actors of this process to unite in our efforts to achieve our common objectives in this field of great beauty, and importance in guaranteeing the rapid and sustainable development of the Albanian economy.

Deputy Prime Minister
Genc Pollo

ABBREVIATIONS AND ACRONYMS

ACES / QSHESH Albanian Centres of Excellence in Science
ALPTO / DSHPM Albanian Patents and Trademarks Office
ARA / QSHK Albanian Research Agency
BIC / QIB Business Innovation Centre
CARDS/ AKRZHS Community Assistance for Reconstruction, Development, Stabilisation
CHES / KALSH Council of Higher Education and Science
CIP / PKI Competition and Innovation Programme
COST / BESHT European Cooperation in Science and technology
CSPTD / KPSHZHT Council of Scientific Policies and Technological Development
EEN / REN European Enterprise Network
EPO / OEP European Patent Office
ERA / REK European Research Area
EU / BE European Union
EUREKA Europe-wide Network for market oriented R&D
FP Framework Programme
GDP PPB Gross Domestic Product
GERD SHBKZH Gross Expenditure in Research and Development
IPA IPA Instrument of pre-accession
IRC QMI Innovation Support Centre Qendra e Mbështetjes së Inovacionit
IPR DPI Intellectual Property Rights
MES MASH Ministry of Education and Science
NSDI NSZHI National Strategy for Development and Integration
OECD OBZHE Organisation for Economic Cooperation and Development
STI SHTI Science, Technology, Innovation
RI IK Research Institutes
R&D ZH&K Research and Development
RTDI ZHKTI Research, Technological Development and Innovation
UNESCO United Nations Education, Science and Culture Organisation
UNECE United Nations Economic Commission for Europe
UNIDO United Nations Industrial Development Organisation
UNDP United Nations Development Programme

Science, Technology and Innovation National Strategy (STIS) of Albania, 2009 -2015

Preamble

Science, technology and innovation are valued as fundamental factors for an insight-oriented economy, and they are important to all phases of development, despite its different forms and manners. Capacities for the development of base and applied research, for adopting and applying new technologies in economic structures, as well as widening their use in society, for developing, in creative manner, new products and services through the use of technology (innovation in products and services), as well as through changes in marketing, design and organisation (non-technological innovation), are fundamental to national competition. The European Union (EU), which Albania aspires to join, has set clear objectives in relation to research and innovation, as part of the "Lisbon Strategy for making the EU the most competitive economy in the world". Albania, like other candidate and associated Western Balkan countries[1], has lagged behind in these developments due to the necessity to concentrate on finding the "foundations" for a just growth (education, legal framework, elimination of poverty, etc.) However, the time has come to invest more in the creation, dissemination and application of know-how, if Albania aims at accomplishing the long term development objectives.

The need for a science, technology and innovation strategy in Albania has been already acknowledged by a wide group of decision makers, and it has been inserted in the current policy making agenda through the drafting of this strategy. Coordinated by the Ministry of Education and Science (MES) and the Department for Correlation of Strategies and Coordination of foreign Aid at the Council of Ministers, assisted by UNESCO and its consultants, this strategy displays a highly inter-sectoral nature, and it has been based on consultations and meetings with representatives of a wide number of ministries and of the "scientific community". It is important for the "ownership" of this strategy to be as wide as possible, and that the importance of continuous investments in STI to be acknowledged by the whole society and the political spectrum in parliament. All countries that have achieved most success in spurring economic competition through STI investments are characterised by wide consensus amongst all parties, which ensures that the engagement towards "insight-oriented society and economy" remains a constant feature of governing policies.

This strategy's Action Plan offers in detail the operational aspects of the proposed measures for the period 2009-2015, while extending this strategy with the proposal for the creation of an Albanian agency for research funding.

[1] Look at, Milica Uvalic, *Science, Technology and Economic Development in South Eastern Europe,* UNESCO-ROSTE
Science Policy Series N°1, 2005.

CHAPTER 1: General overview of current situation in the STI system
1.1 Reforms undertaken in the STI system

Albania is a small country from the population point of view, with a relatively low level of revenues even after two decades of rapid growth. While visible progress has been achieved in restructuring the economy and increasing productivity, competition is still low and based on costs of factors (labour), rather than on high added value. There are currently 430 large businesses, 1580 medium businesses and around 85 thousand small businesses in Albania.

The sectoral composition is inclined towards low technology activities (employment in agriculture remains relatively high), and exports are low, both in absolute and relative terms. An effective STI policy is indispensable for enabling the structural development towards activities with higher insight and added value, in order to accomplish the other measures that support the modernisation of the economy.

In 2006, the Albanian government undertook a deep reform of the scientific research system. The Prime Minister appointed a group of experts from the academic community, who based on the intrinsic assessment of the research system drew a platform for the reform of the scientific research system. The recommendations of the group of experts were offered in detail by the Council of Higher Education and Science, and upon these grounds the government made a series of decisions regarding the reorganisation of the network of scientific research institutes.

The following is a summary of the main results of this reform:

a) the Academy of Science was reorganised according to the model of many other countries. It acts through a selected community of scientists organised in sections and it does not administer research institutes anymore.

b) the Research Institutes of the Academy of Science were detached from its structure and were integrated with the system of higher education. Some institutions are already under the authority of related ministries, while some others are under the authority of the main universities, as follows:

1) three inter-disciplinary research centres:
- Inter-University Centre for Albanology Studies;
- University Research Centre on Energy, Water and Environment at the Tirana Polytechnic University (TPU);
- University Research Centre on Geosciences at TPU.

2) two new faculties:
- Information Technology Faculty at TPU;
- Biotechnology and Nutrition Faculty at the Tirana Agricultural University (TAU).

3) two new centres/departments within the Natural Sciences Faculty at the University of Tirana (UT):
- Applied and Nuclear Physics Centre;
- Biotechnology Department.

c) the research institutes of related ministries were reorganised into 12 technology transfer centres (TTC) and agencies under the authority of ministries, whose main mission is to transfer technology and insight, as well as provide technical support for policy making in the respective fields.

The completion of the structural reform in 2008 through the integration into universities of the research institutes of the Academy of Science and related ministries has aligned the Albanian research system with most European countries, where higher education is integrated with scientific research, which is a fundamental principle of modern science systems. The achievement of the reorganisation process of the scientific research system has created a single, modern, institutional framework, which creates the premises for fast development of scientific research and transfer of insight. Institutions of higher education and the new centres of research and transfer of technology and knowledge have started drawing the development strategy of scientific research and innovation, in the framework of the long term development of their respective institutions.

1.2 Science system and its composing institutions

The science system comprises institutions of higher education, of scientific research, of insight and technology development (innovation). As such, it comprises not only the fundamental public and private institutions of higher education and research, but also enterprises that act in the field of research, development and innovation. Reforms undertaken in the field of higher education and base research aim in the first place to integrate these two systems, which so far have been completely separated one from the other, which shall prove an innovative and efficient approach under the conditions of a small country with limited financial means.

a) Universities are instruction and research institutions, whose mission, according to the higher education strategy (2008), is to provide higher education, scientific research, and the transfer of insight and technology. Width and level of scientific research shall vary in different universities. Currently, there are 11 public universities and 17 private ones. The latter are very “young” (the first private university has been active for only 6 years). However, some of them have started to demonstrate their potential even in the field of research.

b) National Research Centres are instruction and research institutions, whose mission is to conduct scientific research, provide in-depth master and PhD studies, and develop and transfer insight and technology. So far, based on the reorganisation of the Albanology institutes of the Academy of Science, has been raised the Centre of Albanology Studies.

The group's director is appointed every 4 years, following a procedure based on open contest, which requires applicant candidates to present PhD degrees, lists of publications, and their views on the determined field or sub-field of research. All these qualities shall be included in the open, referring session for the interested public. The director shall select and employ collaborators and assistants, as well as exercise the full right to use funds drawn through research and development projects.

Universities and scientific research centres where scientific research covers a wider range shall begin to use contracts, which reflect time spent by each academic staff on scientific and research activities. Scientific "products" shall be periodically evaluated on this basis.

It is important to support the creation of ***regional development centres*** at public universities with limited research capacities, where researchers of different faculties and departments cooperate through conducting important studies for the region. According to the higher education strategy, the creation of these centres shall be supported through an initial incitement fund. ***c)*** The mission of ***technology development and transfer Centres/Public Agencies*** is to conduct development studies and projects and transfer insight and technologies to the practise of production and offering of services. The following centres/agencies exist under the authority of related ministries:

- 6 centres/agencies at the Ministry of Agriculture, Nutrition and Consumer Protection;
- 1 agency at the Ministry of Environment, Forests and Water Administration;
- 1 centre at the Ministry of Tourism, Culture, Youth and Sports;
- 2 centres/agencies at the Ministry of Economy, Trade and Energy;
- 2 centres at the Ministry of Public Works, Transport and Telecommunication.

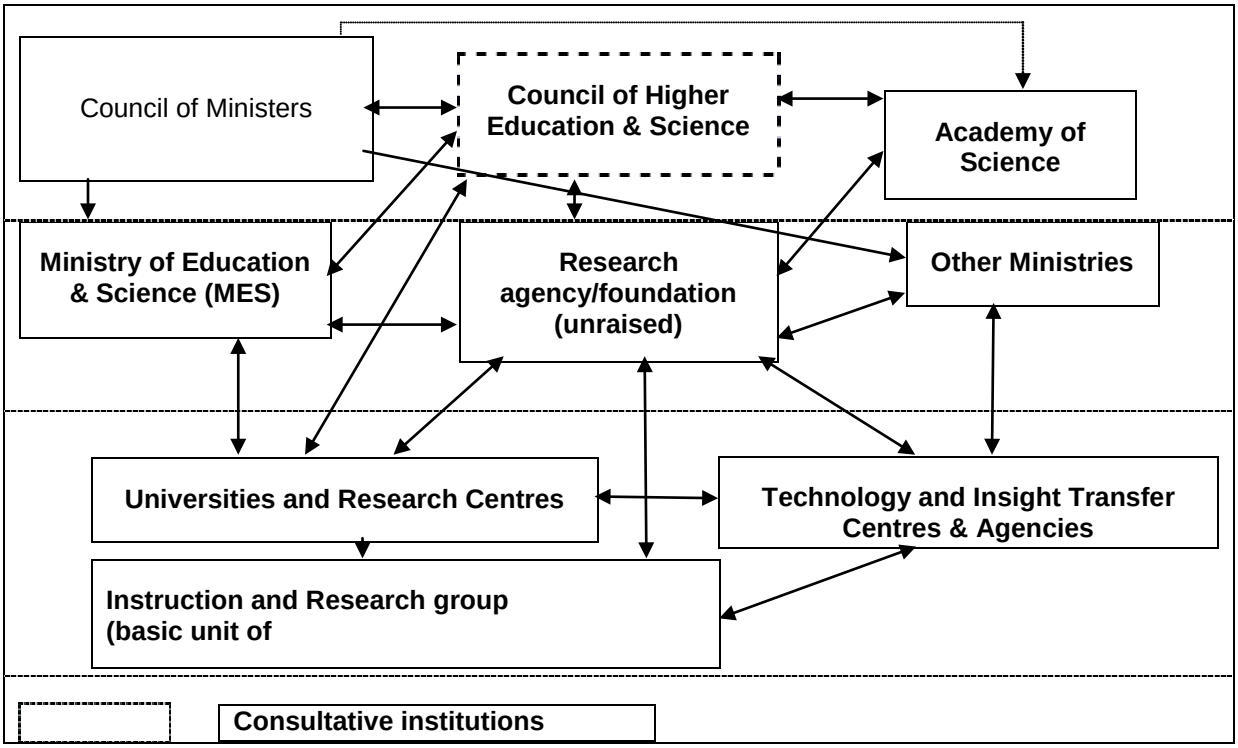
d) Other, private centres/agencies/institutes and enterprises acting in research, development and transfer of insight and technology

This juncture of the system is still taking its first steps of development in Albania. However, the trend is very positive. Currently, there are several such private units under the form of institutes or NGOs that have created clear profiles of competency in determined fields, generally in conducting analysis studies of social and economic problems, as a basis for policymaking. This segment of the research and development system has turned into healthy support for the executive and legislative power. During the last years, the number of private enterprises in the sector of insight and technology transfer in the information technology and communication field has increased. There are few such initiatives in other important fields for the economic and social development of the country. For example, there are very few private initiatives in studies in the field of energy, agriculture, molecular biology and biotechnology, natural resources, etc.

However, the development of private enterprise in research and transfer of technology and insight, in all cases has been faster than that of public institutions, which is related also to the lack of stimulating financial mechanisms for researchers and the lack of a true reform of public institutions acting in the science system.

The current structure of the science system in Albania is presented in the following diagram.

Chart 1: Science system in Albania after the completion of the institutional reform (2008)



1.3 On capacities and performance of the STI system

Capacities and competencies for managing fundamental and applied research in Albania are limited, and in general far from standards that would enable cooperation and integration with international, European programmes. Likewise, scientific infrastructure is obsolete in every aspect and insufficient to support qualitative research. A sustainable programme of re-investments is required in order to acquire the minimum quality level of scientific equipment and premecies for: a) instruction purposes in all fields of science; b) developing new specialities and enforce existing ones, aiming at national and international cooperation. With the support of the World bank, an initial investment ($ 4.9 m) has been made. From the cost effectiveness point of view, it is necessary to correlate a national, investment plan in scientific infrastructure with investments being made on regional level (West Balkans), in order to enable cooperation in equipment and infrastructure.

At this point it would be hard to make a precise statement on the level of investment in STI, or regarding the performance of public, academic or business organisations that conduct research and are involved in the “innovation system” in general. R&D and

Innovation statistics have not been collected according to international standards (OECD, Eurostat, or UNESCO)[2].

However, the first poll of public and academic institutions started during the first semester of 2009, and a survey on R&D in business and innovation will be launched in summer 2009, both supported by UNESCO.

From the investment point of view, estimates, confronted during discussion held for drawing the strategy, suggest that annual gross expense in R&D (GERD) shall reach around 15 million Euro in 2009, i.e. less than 0.2% of the GDP. This expense is almost entirely financed through the public sector and foreign sources. The government has engaged in increasing funding, and the 2009 budget for higher education and scientific research is 2.2 times higher than in 2005. For the first time the higher education budget reached $ 100 million in 2009, of which 6 $ million are intended for "institutional funding" of scientific research (compared to $ 800,000 in 2005).[3]

Currently, the only "research funding" programme is a funding programme with a low level of competition (132 projects for a total budget of $ 5 million for a period of 2-3 years, according to the Ministry), and is directed by the MES.

As stated above, the World Bank has also funded the equipment of instruction laboratories.

The Albanian Government, for the first time invested funds from the state budget and awarded 550 new positions to institutions of higher education and scientific research through a medium term plan (2008-2009) for the implementation of the Brain Gain Programme. So far, 82 assistants and lecturers that have accomplished full master or PhD studies have qualified and have been appointed, on the basis of open contest, to public and private universities in Albania. For the first time in 2007, the Albanian Government implemented a PhD studies programme, the "Excellence Fund", which supported the best candidates in accomplishing partial or complete PhD studies abroad. 45 PhD students have been supported by the Excellence Fund during the years 2006-2007.

The government also funds research through a number of related ministries and public organisations, engaged directly or not in research and innovation activities/policies. These include in particular:

- The Ministry of Agriculture that funds activities in the field of applied research and technology transfer, and in special fields, mainly in response to the needs of the

[2] *Enhancing Science Policy and Management in South Eastern Europe Science and Technology Statistics and Indicators Systems*, UNESCO-BRESCE Science Policy Series n°3, (2007)

[3] Press release of PhD. Myqerem Tafaj, Counsellor to the Prime Minister for Education Issues, Dec. 6, 2008.

agricultural sector. Activities are conducted by the 5 Agricultural Technology Transfer Centres (ATTC) under its authority. The Ministry has a consolidated programme that is implemented in cooperation with the ATTC and other research structures.

- The Ministry of Defence forecast the intensification of R&D activities in the field of security and defence, as part of a long term development plan of the Armed Forces until the year 2020. Furthermore, NATO membership implies engagement in Science for Peace Programmes[4].

- The Ministry of Health has its research programme regarding the improvement of medical services.

- The Ministry of Economy plans to raise an innovation centre, which would ensure services for enterprises related to innovation and technology transfer.

Finally, the limited number of scientific publications and patent indicators confirm the low level of the "product" of the research system. There are no data or studies that would enable an evaluation over the volume of innovation activities (innovations expenses, etc.), or production in the enterprise sector (for example sales of new products and services, etc.) Observations over innovation in other "developing" countries show a relatively high rhythm of investment in information technology, communication and innovation mostly through achieving the desired technology and organisational change, rather than formal R&D. A similar view may be expected in Albania, where most enterprises demanded, in the first place, counselling over the "best, available technologies", and necessary changes in the process of production and staff training. A limited number of medium and large companies, for example in the agricultural-nutrition sector, are potential actors form the point of view of investments for the improvement of R&D products. Until the university sector develops the necessary capacities and infrastructure for conducting more advanced research, there will be few possibilities to develop "high-tech initiatives/enterprises" and investments in "high-tech incubators", etc.

1.4 Legal Framework and decision-making process

The legal framework that regulates issues related to science, technology and innovation has evolved sensibly during the last years, upon approval of the 2007 Law on Higher Education and the amendments to the Law on the Academy of Science. A 1994 law on Development of Science and Technology is still in power. The 1994 law created a Council for Science Policies and Technological Development (CSPTD), as an institution that determines and proposes to the Council of Ministers for approval, policies for the development of science and technology, reviews said policies and makes decision regarding national programmes. By law, the Council for Science Policies and Technological Development is chaired by the prime minister and it includes up to 15 members from the science community and state institutions. However, this Council has not functioned effectively, or has not received funding (for example a secretariat with a determined staff) in order to fulfil its mandate, as it is shown in different reports and discussions regarding the drafting of the strategy. The 1994 law must be reviewed in order to comply to international standards, taking into strong consideration the launching of national programmes in compliance with EU priorities, with the rules of state funding in R&D, researchers' mobility, etc.

[4] http://www.nato.int/science/studies_and_projects/country-reports/ALBANIA-Country-Report-Feb09-update.pdf

The 2007 law on Higher Education created higher flexibility and objectivity in universities' financing, and the Higher Education Strategy determines a number of ambitious aims for the improvement of the university's sector functioning. The primary focus of the Higher Education Strategy is the improvement of the quality of instruction on the bachelor and Master level, but it also formulates a number of guidelines related to academic research, including Master or PhD studies. For example, the Higher Education Strategy stresses the very low levels of students in science, mathematics and engineering programmes (6%, compared to 25% in many countries in the region); or the need to elevate PhD standards in accordance with those of higher education in the European region. These are utterly fundamental issues for the future potential of the Albanian research system, in order to conduct high standard research of international standards. Thus, the development of the research potential in the most fundamental and academic types of research shall pass through phases, taking into careful consideration investments in infrastructure or in research programmes, not only regarding "good plans" (for example, research must respond to national strategic priorities), but also regarding realistic capacities for conducting research (for example, availability of qualified human resources).

A council of higher education and science (CHES) was created with a 2006 amendment to the 1999 Law on Higher Education. CHES was created as a consultative unit for the Ministry of Education and Science and the Council of Ministers. Its main role is to advise on strategies, policies and priorities (for example the strategic, 5-year plan proposed by each university in order to evaluate its compatibility with this strategy. The Higher Education Strategy proposed the creation of a small, high level group for the Research Strategy (GRS), under CHES authority, that would be responsible for the development of a research strategy and its monitoring. It remains to be seen up to what point CHES-GRS make the role of CSPTD redundant, although for the time being there is no institution advising the government on STI priorities.

As mentioned above, a major change in the research system occurred with the amendment of the Law on the Academy of Science[5], which resulted in the integration of former institutes of the Academy of Science into the main public universities since 2007. Just like in other European countries, the role of the Academy by now is more representative and consultative for science, rather than conducting research. In addition to consultative functions, the role of the Academy continues to include the management of scientific publications, like bibliographic publications on magazines in Albanian, as well as inciting science through conferences and prizes.

The integration of the former research institutes of the Academy of Science in the university sector and the development of a research strategy at each institution will surely require time. During consultations regarding the drawing of this strategy it was clear that rectors, deputy rectos, deans and chiefs of departments at the three main universities are just starting to draw the bases for the development of strategic management of research. In order to achieve success, this process shall require technical support, "training" and resources. If we want to structure the basis of scientific research so that it is effective from the research point of view and sustainable from the financial one, through a mix of national, public funds, and international donors (including charities that support research), in the medium term it must generate revenues from contracted research and other services that shall be provided to enterprises.

[5] Law No 9655, 11.12.2006, amended on 27.12.2007 and 07.07.2008.

Currently, the “research policy” is administered by the Science Directorate at the Ministry of Education and Science (MES). Funding of research and development has been achieved by the government through the institutional fund, through MES funding for the programme, through funding in the framework of bilateral programmes and through international cooperation. The latter, a practise used currently, is widely funded by donors, is still not widespread and may still be considered as a pilot project. While there have been visible attempts to concentrate resources and insert competitive criteria, this policy has not been generalised yet.

For the time being, the MES is not equipped to accomplish its role of policy marker or supervisor; or it shall implement current funding programmes, and certainly not those of the future envisioned in this strategy. MES policy making capacities in the field of research are sufficient, also in consideration of the fact that staff members have been included in research policy cooperation initiatives in Western Balkans. Furthermore, the Science Directorate has remained without a director, and the 4-5 members of staff struggle to enable the current programme with limited funding for the applicants (delays in selection and the annual disbursement rounds make interested parties unhappy with this process).

1.5 Albania’s International and European cooperation in STI

The international dimension is vital to the rapid integration of the principles of excellence and competency in STI into the national research system. This will enable participation in international funding cooperation in this field. Albania has experience in international cooperation in a wide number of fields of the social-economic development and higher education through programmes such as BE CARDS, Tempus – higher education, World Bank support for Higher Education (a loan for the development of education through the Innovation Initiative 2010 of the European Investments Bank), and multilateral cooperation with many agencies of the family of the United Nations (UNECE, UNIDO, UNDP). Cooperation in a specific field like STI is till limited, however a number of bilateral cooperation agreements on research are very important from the symbolic point of view, if not the financial one, as they create the basis for exchange and partnership. Full participation in the EU Seventh Framework Programmes on Research (since 2008) is a first step towards the gradual integration in the European Research Area (ERA) and opens up prospective of further funding in the research system in the medium term. Furthermore, several other international organisations, such as UNESCO (support for R&D statistics and expertise on science policy) and the World Bank, are currently continuing to offer support through the Loan for Higher education. The possibility to find support in the future for the implementation of the strategy through the Instrument of Pre-Accession (IPA) must be taken into account and optimised at best. This strategy aims at offering a framework through which the multi-party forum of donors and bilateral cooperation may contribute in a structured manner to strengthening Albanian capacities in R&D.

Gradual adaptation of a process similar to the “plans of national reform” in the EU member states, according to which the Albanian government must engage in the long term priorities in the fields of research and innovation policies, is a high priority from the internationalisation point of view. This includes a quantitative evaluation of GERD/GDP, but also the identification of challenges and policies that will address then in the short and medium term.

Countries like Estonia, Ireland and Slovenia may be used as standard models for Albania, because on one hand they have comparable size, and on the other they have accomplished very rapid progress in economy and research. Ireland, in particular, once

the poorest and less technologically advanced country amongst the 15 EU members, turned into one of the richest countries in competitive research capacities of the highest consideration on the international level.

At the same time, if Albania relies completely only on foreign funding sources, and in particular on the highly competitive EU structure, like the Research Framework Programme (FP7), this may lead to considerable disappointments, because funding decisions are hard to predict. On the other hand, relying exclusively on national expertise and funding will not lead to new border research, since the size of the national scientific community is too limited to ensure the whole range of capacities and the required experience. The vicious cycle: the strengthening of competitive advantages in scientific research and the creation of competencies for receiving funding through the FP7 will help in strengthening national excellence.

CHAPTER 2: Vision, priorities and strategic aims

International experience suggests that it is important to have wide consensus amongst parliamentary parties regarding the position Albanian science must occupy within the next 8-10 years (some countries use time frames and systematic predictions of 20 years) and which wide, social-economic aims would best be served by the reallocation of added public funds for science.

The vision of science, technology and innovation is based on the single most important source for an insight oriented economy. Until 2015 the government will attempt to make sure that Albanian scientists be appraised for undertaking research of international importance in a number of selected fields.

Achieving this vision requires:

• improvements in the basic infrastructure of research, sufficient to support university formation at its three levels (BSc, MSc, PhD);
• creation of scientific excellence in the most important research fields for the country;
• formation and retention of qualified personnel in the Albanian research system;
• better public understanding of science and awareness on the role of innovation and new technologies on society.

This may happen only through large and well oriented funds, through modern and suitable management of policies, as well as through the gradual integration of the research system into the European Research Area (ERA).

In accordance to the National Strategy for Development and Integration (NSDI), which contains a limited number of priority sectors (tourism, agriculture and agro-processing industry, and exports), the STI will focus on several priority areas, enabling the concentration of the few resources into main groups of capable researchers, in order to achieve an international level of recognition and excellence. This will not exclude other fields, as a minimum of capacities in base or applied research is necessary to update instruction in higher education, ensure services for enterprises, or respond to social needs. However, concentration is a precondition of excellence, as it is accepted on the European level.

Internationalisation, integration into the ERA and raising national competencies, reciprocally strengthen each other. Albania is engaged to play as full a role as possible in research programmes and European level initiatives, in accordance to its financial means and strategic interests, by inciting the participation of Albanian scientific labourers in the EU Research Framework Programme and integration into other European research initiatives (COST, EUREKA, etc.)

In addition to that, the business sector shall be encouraged to modernise and improve its capacities to cooperate and commercialise results of research conducted on the national level, as well as to adopt technology of international standards through the acquisition of advanced machinery, etc. (and organisational changes and respective trainings). It will be necessary to undertake further measures to support Albanian companies in this process, including support for innovation management and strategies in production enterprises, counselling services and transfer of technology. IPA and EU funds shall be raised and Albania's access to the Competition and Innovation Programme (CIP) shall be followed, including the funding of the European Network of Enterprises for the strengthening of insight and capacities to support innovation in the company.

In order to gradually increase cooperation between the different elements of the "Innovation System", organisations that represent economy sectors shall be attracted, to enable them to the raise awareness and motivation of their member firms regarding innovation. Similarly, trainings in the framework of the STI Strategy will take place, by building the fundamental, respective capacities and encouraging enterprises with technological or R&D capacities, to work with institutions of higher education in determining students' curricula and in a later phase relevant industrial doctoral studies.

Thus, the vision of the Albanian system in STI in this strategy is:

"(i) achieving a sufficient or critical level of research in order to support university instructions in its three levels (BSc, MSc, PhD), as well as (ii) achieving excellence in a small number of priority fields until 2015, through concentration of national and international resources and close cooperation with Europe, as well as through providing systematic support for innovation and technology transfer, in order to respond to the needs of the production sector"

Complete reliance on national funding and capacities will lead towards new research fronts, in order to ensure the whole range of required capacities and experience.

In addition to establishing the priorities of the excellence fund in base and applied research in specific fields, the production sector will need to modernise and improve its absorbing capacity of research results conducted on the national level, as well as to raise technology to international standards through the acquisition of advanced machinery, etc. (with respective training). It will be necessary to undertake complementary measures to support Albanian companies in this process, including support for management and innovation strategy at counselling service for enterprises and plants and the transfer of technology.

2.2 Research Priorities

Selection of priority fields in science is a very challenging obligation, as the process underpins the establishment of several key priorities over which financial sources will focus, while there is pressure exercised by actors left out of the established priorities in order to retake measures and include more fields in the priority budget. International experience shows that the best manner to determine priorities is to proceed according to a combination of priorities from down-up and up-down.

Research orientation is normally achieved through a number of national research programmes that aim at the selected fields as a priority due to their social and economic importance. The National Strategy for Development and Integration (NSDI) underscores the importance of modernisation of sectors of the economy such as the agro-nutrition industry and tourism, as well as the strategic importance of energy, the environment and management of water resources.

In parallel have been presented proposal on the prioritisation of research fields by decision makers of the research system in fields such as: agriculture and nutrition; information technology and communication; public health, humanistic and Albanology studies; natural resources; biotechnology and biodiversity; protection and safety.

Strategic management of the research system and objective and informed selection of national priorities will require the development of capacities in order to progress (the

range of technological development, evaluation of technology) through or upon request of counselling units, which advise the government and parliamentary commissions.

Simultaneously, it is important to not go after only preselected up-down terms, neither to widen them beyond measure, until we will have ensured the needed extra funding. The structuring of research potential through competitive calls for proposals that incite researchers to work together in inter-institutional and inter-disciplinary manner will lead to proposals and "individual initiatives" from the researchers' community.

A fundamental criterion for the selection of research terms shall be the demonstration of the capacity of potential to create a critical mass of excellence under the form of groups of researchers that work together for a medium term action plan, on which all have agreed (five to seven years). Based on international experience, the size and budget limitations of the Albanian research system allow for the creation of 4-5 centres of excellence, initially for a five year period, but in more realistic terms the maturation of these centres may require a period of ten years. The development of these centres of excellence will be critical for the improvement of credibility of the Albanian research system within the ERA, and precisely for this reason it will maximise the influx of funds from EU research programmes (FP7, COST, Eureka, etc.) The procedure for the development of these centres is presented below.

2.3 Aims and Steps

The abovementioned vision and priorities must translate in concrete aims and steps, in order to move towards systematic monitoring of progress and assist in reaching the programme's objectives. The small part occupied by research and development in the sector of higher education is explained mainly with the lack of direct funding for many years during the transition period and the lack of available human resources today. It isn't very likely that the private sector shall invest widely in formal research and development in important manner (in the most developed countries the private sector contributes with 2/3 of R&D funds), but this aim will enable the structured development of product development and innovation activities in a minimal number of firms.

Strategic aims may be summarised / quantified as follows:

1. Increase of public expenditure on research up to 0.6% of the GDP in 2015. Part of the observers found this aim to be very modest; however, it would represent a great success compared to the current situation. At the same time, it would be a relatively higher expense compared to a number of less developed EU countries, some other countries in the Western Balkans and many growing economies.[6]

[6] See for instance figure 4 in UNESCO's Fact Sheet (2007) for a comparative perspective: http://www.uis.unesco.org/template/pdf/S&T/Factsheet07_No%20%205_ST_EN.pdf
or the Global Innovation Scoreboard 2008:
http://www.proinnoeurope.eu/admin/uploaded_documents/EIS_2008_Global_Innovation_Scoreboard.pdf

2. Increase of gross expenditure on R&D from foreign, EU sources (FP, etc.) and international donors, which should cover 40% of R&D expenses for the years 2009-2015.

3. Creation of 4-5 centres of excellence in science (CES), including dedicated laboratory equipment, or production facilities, which would be used by firms based on new technology (preparatory work, testing, certification, etc.)

4. *Doubling up* of the number of researchers through brain gain and training of young researchers (creation of post-graduate schools; *training of 500 people in PhD degrees*). In accordance to the action plan of the Higher Education Strategy, this will require the creation of up to three post-graduate schools (or PhD programmes) at Albanian universities; these post-graduate schools will open in the priority fields selected by the government in cooperation with the National Council of STI and/or will relate to the selected centres of excellence.

5. Increase of innovation activities in 100 companies (this figure may be reviewed after the publication of the first results of the business survey on technical research & development and innovation) through investments in R&D of the laboratories themselves or through consortiums with academic research institutes, or in cooperation with foreign partners.

CHAPTER 3: Policies to be followed

3.1 Structuring of policy implementation

The proposal is to structure the intervention in policies that shall develop along a six-year period, 2010-2015, according to **five main programmes**, in addition to existing funding, on which is possible to make effective savings:

A. *Research Infrastructure Fund*, with the objective to improve equipment and available locations at public and university research institutes, on such a level as to enable the development of research projects according to international standards. This programme will follow open tender procedures regarding the proposals presented by individual research institutes or universities in general.

i. Examples include: Research Equipment Programme in Croatia, or the Research & Development Infrastructure Programme in Estonia, or on a different financial level the Irish Programme on Third Level Institutes, or Polish Support for Common Project on Research Infrastructure.

B. Creation and development of ***Albanian centres of excellence in science*** (ACES), with the objective to develop 4-5 centres of excellence that bring together a minimum of 20 researchers (main researchers, post-graduate researchers and PhD candidates) from at least two research institutes involved in various cooperation efforts. i. Centres of Excellence in Science in Estonia, or the Research Groups' Funding Programmes in Slovenia may serve as models. C. ***Eagles' Grant Research Programme***, which aims at raising the number of specialists that graduate in Master and PhD degrees in science and fields of engineering as a priority, and that conduct post-graduate research or projects in Albania. This measure must relate to the development of PhD studies according to the Higher Education Strategy. The programme shall finance young researchers to conduct PhD Studies in Albania (when PhD programmes will attain international standards) and to follow PhD training in BE 27, as well as provide grants to researchers that return from foreign countries (including payment and covering of displacement expenses).

i. Lessons may be drawn from the pilot experience of the "Brain Gain" programme; a series of EU schemes may be used as model, for example Brain gain Croatia, Eötvös Scholarships in Hungary, Young Researchers' Programme in Slovenia or Odysseus Programmes in Flanders (Belgium). D. ***National Programme on Technology***, which aims at bringing together a consortium of academic research institutes with the private sector, or other organisations of the public sector (for example water and energy services), in order to develop a medium term programme of applied research with social and economic impact. The aim would be to minimally launch such a program in the period 2010-2015, and 2-3 more until 2020. ***The creation of a special fund*** by the government is needed to stimulate companies in the field of innovation and transfer of new technologies. The experience of Austrian technology programmes may be adapted to the specific context of Albania.

E. ***Science and Education Incitement Programme***: promote science to young people and fund a limited number of universities in order to raise the number of people with PhD degrees. Various schemes of assistance and care, or "awareness on innovation" initiatives in BE 27, may serve as models to be followed. The Albanian Academy of Science, in accordance to its new mandate, must be included in this programme.

All abovementioned programmes shall be administered on the basis of competitive calls for projects or applicants (as is the case of individual grants for the engagement of researchers). For example, the programme of centres of excellence will follow the following procedure:

1. Declaration of call for cooperation between domestic research groups (inter-institutional), which shall initially present a structure proposal that, will show the theme of research. Proposals shall be evaluated on the basis of: a) potential strategic influence for Albania, b) the critical mass of researchers that come from at least two institutes/universities/research centres.

2. Preliminary proposals that are selected shall receive a grant to conduct a feasibility study and present the complete proposal for funding, which shall include: the group of researchers, the strategic plan and aimed scientific achievements.

3. Complete proposals shall be selected on the basis of quality of the strategic plan of research and a number of specific selective criteria (publications, impact on national production possibilities, international prestige (for example partners in EU countries), *number of participating groups, international funding options, relations to university training, etc.)*

4. Use of an international experts' panel for selection.

5. Ensure funds for six years for working costs (including operative costs); infrastructure (buildings); equipment; training (including study trips) related to the strategic research programme of the centre.

6. Be object of careful international review after three years and full evaluation at the end of the six year term.

Furthermore, drawing and implementing these programmes shall require considerable strengthening of managerial and policymaking capacities of the programme. It is necessary to collect funds, including support from the EU and other donors for the creation and operation of an organisation for the management of the research programme (look at section 3.2 below). The research programme management obligations shall include the administration of calls for proposals, funding of projects for scientific and applied (industrial) research, and evaluation of certification of institutes that have the right to participate in such programmes.

The above mentioned group of programmes shall not focus specifically in spreading insight or in activities for commercial research, except those cases when an expected impact of research (for example centres of excellence or technology programmes will contribute in the development and adoption of new technologies). This is on purpose. Experience shows that most Albanian enterprises are not capable to start investing in applied research and development, or in contracting advanced services. At the same time, it is necessary in the first place to create a basis for science, capable to develop excellence in research, which may lead to valuable results that will prove the concept of investments (prototypes, etc.) However, it is unlikely that this will happen in the first five years.

Activities for spreading and transferring technology are vital to a transition economy like the one in Albania. Data from reports and discussions organised for the drawing of this strategy suggest that many of the researchers, both in the previous Academy system and the university system, have engaged in active manner in “applied research” or in ensuring services related to specific needs of the economy and society. It is indispensable to transform this influx of services to enterprises into formal, professional services that generate revenues towards research institutes.

At the same time it is necessary to ensure that Albanian enterprises acquire the best technologies are part of their modernisation plans, or train their employees in these technologies.

There is need for a special measure from the government for funding to stimulate companies in the field of innovation and transfer of new technologies. In this context, international experience shows that it is most effective to couple such financial support with counselling services (the Production Counselling Service in the United Kingdom is a good example).

The Proposal of the Ministry of Economy to develop a national centre of innovation and technology transfer, is clearly complementary of the proposed programmes in the STI Strategy. Ideally, this could follow the examples of best practise from the network of business and innovation centres (BIC) and innovation and research centres (IRC) developed in the EU during the last decade. BIC and IRC cooperate in the framework of the European enterprise Network (EEN), funded by the Competition and Innovation European Programme. The Albanian Innovation centre should hasten to apply for rapid membership and support from the EEN programme.

3.2 Strengthening of policy making capacities

The strategic direction of research policies requires a number of skills, possibilities and organisations. Minimally, research policies and the funding system should be able to:

• Understand the strong and weak points of the system (intelligence on policies)

• Determine focus and themes of political action (establishing priorities)

• Ensure correlation of activities beyond the fields of research policy (horizontal links to other fields of policies) • Implement policies in effective manner from the costs point of view

• Learn from past experience (evaluation) or best practise elsewhere

• Make adjustments to the whole cycle of politics.

Certainly, the current system in Albania is far from being capable to satisfy these "minimum conditions". A deep reorganisation and more clear separation of duties are required. The Albanian government is engaged in improving capacities and required skills in order to ensure good management of the process of drawing and implementing the STI Strategy. The required skills may be classified as follows:

• Strategic and operational management of research and technological development programmes (RTD)

• Systems and methods for selection, monitoring and evaluation of these programmes and funded projects

• Techniques for the evaluation and accreditation e the management of conducted activities by the research and technology organisation (public and academic, and in the future potentially private), which are the direct representatives of the programmes.

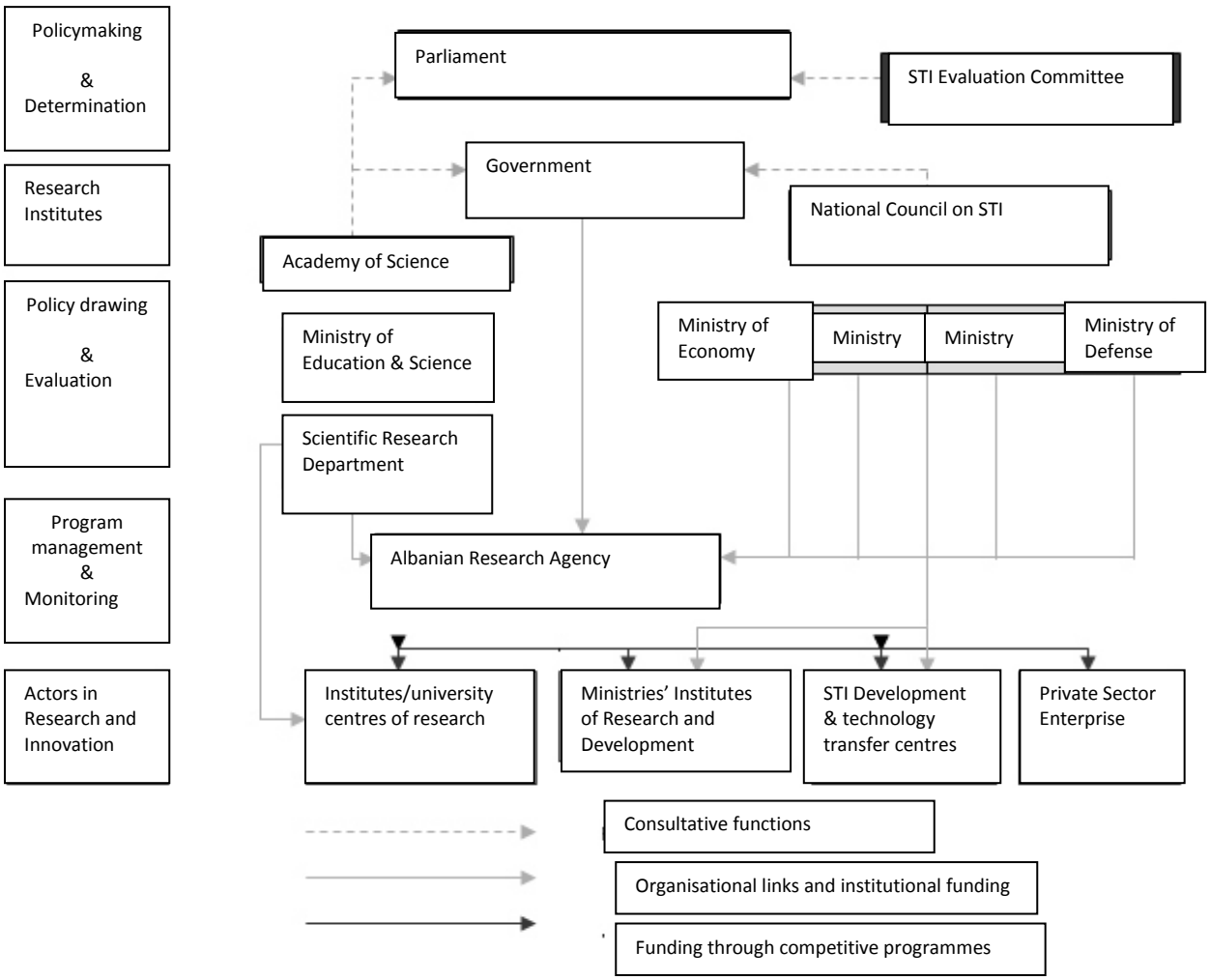
Regarding the establishment of priorities, supervision and adjustments in the cycles of research policies, a national council on science and innovation must be raised, with enough political credibility, chaired by the prime minister, and with a balanced group of decision makers: one third from the government, one third from academic research, and one third from the business community. In this framework, the strategy proposes raising a single national council on science and innovation, as well as s special secretariat with at least two experts to support its activity and a budget for commissioning studies of policy studies (study visits, etc.)

Secondly, intelligence functions of the research policy (R&D analysis and statistics, etc.), policy making, the provision of horizontal links to policies of other fields and the evaluation of research policies must be brought together under a single department of the government, with a clear mandate and sufficient resources. The improved department of Science at the Ministry of education and Science must play this role, and it must contain a group of 4-6 qualified experts, supported through a training and technical assistance programme.

The following chart offers a simplified view of the Albanian research system, based on the assumption that the option for the creation of an Albanian research agency has been seen through. The flows of funding mean that the Ministry of education and Science will delegate the management of competitive funding programmes to the ARA

and it is assumed that other ministries will do the same thing (for example, regarding a national program in technology in the agro-nutrition sector, the Ministry of Education and Science, the Ministry of Economy and of Agriculture could all contribute with funding through the ARA). If the agency integrates the activities of the Ministry of Economy, Trade and Energy regarding innovations (for example the proposed innovation centre) than the name could reflect this range and be called the Albanian Agency of Research, Technology and Innovation.

The National Council of Science and Innovation, (NCSI that replaces the CSPD) must be chaired by the prime minister. The NCSI may operate according to the two subcommittee options (like in Estonia): one for business innovation and counselling to the minister of Economy, Trade and Energy, and the other, the Council on Higher Education and Science with a consultative role to the minister of Education and Science. The chart also includes a proposal of the Albanian parliament regarding t commission for the evaluation of science, technology and innovation.



Most European parliaments have created a capacity in the evaluation of technology to aid them in decision making, when dealing with a scientific or technological issue. The consultative role of the Academy of Science is reflected in the chart. Even the Academy of Science may receive funding from ministries of the ARA for specific duties related to scientific publications, the promotion of understanding of the public role of science, the promotion of scientific careers, library functions, etc. These funding items have not been reflected in the chart, in order to simplify the visual presentation of the diagram.

3.3 Creation of programme management required capacities for the management

The implementation process of the STI Strategy has been envisioned as a chain of **performance contracts**, which will relate progress and results of individual projects (funding for research institutes, individual researchers, enterprises, etc.) with programme management (high level) and with the policy level in ministries and the government. High quality is required to ensure good functioning of the whole chain of performance contracts, not only in activities at all levels, but also in agreements between levels.

Table 1: the hierarchy of programme management

Policies	• Decide on policies portfolio & allocation of resources • Determine the reasons for the development of the programme • report on progress & projects' performance Consensus regarding the programmes objectives
Programme	• Manage and allocate sources for the project • Evaluate projects: appraise; monitor; evaluate • Report on progress and results Consensus regarding the project's aims and plans
Projects	• Manage projects and human resources • Report on progress and results

Programme managers look after and allocate the resources of the programme for a series of projects. This includes:

• evaluation of project proposals;

• selection of projects to be funded;

• their monitoring to ensure that they progress according to plan and reach desired results;

• the evaluation of their quality.

In order to satisfy consumers of policies, project managers shall report on progress and their results.

In the same manner the programme objectives represent an agreement between the policy makers and the programme managers, so that the aims and plans of the project constitute the basis of the agreement (often clearly under form of contracts) between the programme managers and the project directors. The project level is responsible for implementation in practise and reporting of results.

The management and programme evaluation experience in other European countries enables us to break up the presented model-process into a number of individual obligations. For example, the process of "project receival" may be broken down as follows:

• Communicate/inform regarding the programme possible/interested participants,

• Receive high quality proposals;

• Evaluate proposals;

• Make decision to fund;

• Sign performance contracts with project leaders.

Each of these individual obligations is further broken down into a number of **standardising indicators**, qualitative and quantitative, according to which data are collected on the basis of separate programmes. This logic of performance contracts raises the issues of the organisation that should guarantee the implementation of the programme and daily management of research funding programmes in Albania. There is no single model that may be applied. Based on European experience, different countries choose to implement programmes through the same ministry that draws the policy (for example the case of Italy or Greece)[7], or through specialised implementation agencies (for example the case of Estonia, Hungary or Slovenia)[8].

Some groups of experts and latest works of Albanian experts[9] have suggested the need for the creation of an "implementation agency" regarding research funding, mainly through competitive funding programmes; a valuable partner for international and

[7] Ministry of University and Research in Italy, or the General Secretariat on Research, Technology, Ministry of Development, Greece (look at Appendix).

[8] Slovenian Research Agency; Archimedes Foundation (Estonia), or the Hungarian National Research and Technology Office. Look at detailed examples in the Appendix.

[9] For example*, the Reform of the Scientific Research System, Report of Expert Group led by PhD. Tafaj, January* 2006.

bilateral cooperation with similar agencies of research funding in other countries of Europe. As a matter of fact, there is a current trend in the countries selected as “control countries” (Estonia, Slovenia or more advanced countries, such as Austria, Flanders or Finland) to divide the policymaking function from policy implementation. At the same time, particular stress must be put on the advantages of a more flexible structure of an agency capable to act as “point of contact” and take part in various initiatives of EU support for cooperation in R&D and innovation.

Taking into account the inter-sectoral nature of the research strategy and the objective to develop in time a number of national programmes on technology, related to the need to create a structure with the potential to promote Albanian capacities in science and technology in EU programmes, the option of an agency seems reasonable. However, there should be a clear division of activities and the agency must not lead to the weakening of the capacity of the Ministry of Education and Science to develop and analyse policies.

3.4 Improvement of legal and institutional framework on research and research funding

The legal framework in Albanian and the need to review law that deal with research, technological development and innovation have been presented since the beginning. The re-drawing of the general legal framework is part of the process of Albanian integration in the European research region and it must include aspects related to legal adjustments required for European Partnership for researchers (career improvement and engagement of researchers), common programming, etc., as well as adjustments to the Albanian law according to EU State Aid in R&D and Innovation. The EU’s IPA Programme is understandably the primary candidate to ensure technical assistance for the Ministry of Education and Science, and this assistance also helps in strengthening capacities at the National Council on Science and Innovation and other ministries with funding activities in the field of research.

The most appropriate legal framework for proposed research funding agencies has been the object of discussion during the last years, well into the drawing of this strategy. This is a political decision, however, the strong and weak points of the various options may be summarised as follows:

• Strengthening of the Science Directorate at the Ministry of Education and Science in order to draw and implement policies.

- On paper this is the less expensive option and it could be supported through a technical assistance project for the training and improvement of insight of the staff.
- The main disadvantages seem to relate to the difficulty to draw and maintain qualified staff in public administration. The creation of a highly qualified unit in relation to policies within the ministry is one of the top priorities and it aims at

developing the professional framework of programme managers, with the required administrative and technical skills.

• Creation of an independent agency, Albanian Agency of Research, Technology and Innovation (ARTI), which shall be the implementing institution of the Science, Technology and Innovation Strategy, created by special law. This is obviously the most ambitious option, which would require a feasibility study and a “business plan” for a functioning period of at least 5 years. The agency would function on the basis of a special budget and it would report to a board of directors, which ideally should represent stakeholders (government, research system and at least 1-2 representatives of business and civil society).

Most interest groups consulted during the drawing of the strategy preferred the ARA option, however, this will require a complete feasibility study and an operational plan that must be drawn before the government makes a decision. The action plan of this strategy presents an initial conceptual plan for the ARA. It is most important to create capacities to manage at least the centres of excellence and research infrastructure programmes during the first semester of 2010, if these two “fundamental” initiatives of re-development of the Albanian research system will start in time. It is necessary to raise funds for bilateral cooperation, get EU support through a IPA project or “twinning up” to an existing research agency in the EU in order to ensure the drawing and optimal launching of the ARA.

From the point of view of intellectual property right, Albania is still not a member of the European Patent Organisation, and one of the few European countries that has not approved the European Patent Convention, although invited to do so. As a matter of fact the administration of property rights is conducted by the Patent and Trademarks Office (ALPTO) at the Ministry of Economy, Trade and Energy (since May 2006). Entry into the EPC and membership in the EPO must be followed as one of the objectives of this strategy. Simultaneously, it will be indispensable to amend Albanian laws and procedures and develop support services for academic researchers and industrial enterprises related to patents and other forms of protection of intellectual property rights and management practises. The proposed ARA and the innovation centre could initially undertake steps to promote the practise of rights on intellectual property, respectively for academic institutes and the enterprise sector.

Likewise, precedence must be given to the integration of Albania in other European organisations, such as full participation in the Competitiveness and Innovation Programme, COST and EUREKA. A technical assistance project funded by the IPA could develop a service of “one-stop shop”, where the ARA could play the role of the National Point of Contact for FP7, CIP and projects such as COST and EUREKA. This implies that the agency staff must be composed of technology specialists, financial counsellors, planning and implementation experts, as well as an administrative staff that manages funding applications.

3.5 Adoption of a suitable budget framework

The budget framework for the implementation of the STI strategy has been determined for the period 2009-2015. All figures regarding future years must be considered as estimates at this stage. There is a general idea that actions in 2009 and during the first semester of 2010 shall concentrate mainly of the preparation of detailed programmes and the creation of the managing capacity under the form of the ARA (taking into consideration that this is the preferred option)

(in millions of Euro)	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Basic funding for research institutes	7.5	8.25	9.00	9.90	10.50	11.55	12.75	**69.45**
Funding of research projects (MES)	6.5		6.5		8		9	**30.00**
World Bank funding on Research Infrastructure	3.3							**3.30**
Research Infrastructure Fund	0.15	4	4	4	5	5	5	**27.15**
Albanian Centres of Excellence (ACE)	0.15	1.5	1.5	1.5	1.5	1.5	1.5	**9.15**
Eagles' Grant on Research	0.15	0.2	0.2	0.2	0.25	0.25	0.25	**1.50**
National Technology Programme			0.15	2	2	2	2	**8.15**
Albanian Science and Research Agency	0.25	0.5	0.5	0.5	0.5	0.5	0.5	**3.25**
Total funds	**18**	**14.45**	**21.85**	**18.1**	**27.75**	**20.8**	**31**	**151.95**

* This item of the education budget is US $6 million in 2009;
** according to the MES information over 132 projects have been funded for a budget of $ 5 million in 2-years.

A basic consideration has been drawn regarding the progressive growth of national public funding under the budget of higher education and the "small" research projects, which are currently managed by the MES, but that may be transferred to the ARA upon its creation. If the aim to devote 0.6 % of the GDP will be achieved, this growth must be maintained and taken further.

Current support from the World Bank for instruction laboratories, through the higher education loan, has been included (approximately $ 2.6 million in 2009).

Figures on the budget table are based on the assumption that bilateral or multilateral donors will complete the available national public funds. Preliminary discussions with the World Bank give hope for the possibility of allotment of funds through other loans in the future in research and the framework of the reform in higher education. Likewise, the EU's IPA programmes are believed that will support the implementation of the research strategy. Funding of the research infrastructure may be supported through regional programmes, and potentially from the EIB.

These figures do not include potential funding on research ensured through the participation of Albanian researchers and institutions in the EU's FP7 or in other European level, research funding programmes.

CHAPTER 4: EVALUATION AND MONITORING

4.1 Procedures and responsibilities

Policy drawing must be based on fact. The first step towards facts is through evaluation, which feeds and supports the review and adoption of priorities and implementation of policies. Evaluation is culture, but also a most demanding obligation. Countries that have decided to build a culture of evaluation have done so rapidly by adopting the necessary legislation and by creating budget leverage. This enables them to evaluate all organisations and major measures that support research.

While there are many models that may be discussed when the system will mature, it is most important to begin with some basic steps:

A. Institutional Evaluation

All organisations shall be evaluated in periodic manner. At this stage, universities are expected to apply evaluations in the context of adoption of the Bologna Process. Since this is bound to happen, it is recommended to include in this evaluation a number of questions that will help in gaining a better view of the research performance at universities.

In the first phase, all universities and centres must be asked to conduct an evaluation of their research infrastructure. An agreement must be reached regarding the timing and the concrete process in view of the advancement of the Bologna Process. The role of the Albanian Research Agency in the evaluation of research capacities of the scientific community must be clearly specified, in order to complete the work done by the National Accreditation Agency over the quality of instruction in higher education.

An evaluation must be made also of non-university research centres. International formats are suggested; however this must be delayed, because priority is given to other evaluations.

The selected centres of excellence, mentioned beforehand, must be carefully monitored during the period they benefit of preferential support, through their performance indicators, used in European countries of the highest performance.

B. Programme Evaluation

All future programmes with budget over 1,000,000 Euro shall include an evaluation chapter, normally 1-3% of the budget. The five proposed programmes should undergo one medium term and one final evaluation. These evaluations shall be authorised by the Ministry of Education and Science, or other related ministries that fund programmes, and will be based on data monitoring and the continuous review of ARA managed projects. Medium term evaluations may include an ARA report on the implementation and progress of the project regarding the National Council of Science and Innovation, to

which may be attached a review of scientific research by the project's counterparts. However, the Ministry of Education and Science, through a Supervision Committee with representatives of other ministries, must commission a group of foreign experts to make the final evaluation of the programme in order to ensure the report's independence and to ensure a solid base for the review of programmes in the period post 2015.

Furthermore, at the end of the time period of this strategy, a complete analysis of the whole strategy shall be conducted; this may be commissioned by the Deputy Prime Minister, in the name of the National Council of Science and Innovation, which could serve as a control board for the evaluation of the strategy.

C. Organisational adjustments

While during the initial phase evaluations may be conducted in individual manner, it may be of interest to study the Austrian scheme of the "Evaluation Platform" and to envision for the future a similar forum for Albania. When more programmes become operative, it may be necessary to coordinate evaluations through an independent organisation (for example the planned agency). However, in order to maximise benefits and assist people through training, it is important to ensure full transparency of evaluations and to launch the practise of discussion over these evaluations and methodology exchange in an organised forum. The evaluation of the programme and capacities is usually under the authority of the ministry or ministries that fund programmes, and it shall be independent of the programme implementation agency.

4.2 International standardizing instruments

There are three major analyses used to create indicators on R&D and Innovation. These analyses lead to a list of mandatory indicators for European member countries, also collected on the international level (on voluntary basis) through the UNESCO Institute of Statistics (UIS). These include: 1. *Research – development analysis*, based on the "Frascati Manual", which gives a general overview of investments in research and of the selected results in the country. The first research-development analysis shall be conducted in the framework of the current agreement with UNESCO. It is important to guarantee its renewal in regular intervals, in order to produce data over time that will demonstrate both national trends and comparisons with Europe and the Balkans region.

2. Innovation Analysis, based on the "Oslo Manual". This analysis addresses only European companies and member countries, and it has a standard questionnaire and data processing software. The first analysis in Albania is planned to take place this year, in conjunction with the research-development analysis. In the past this analysis was conducted once every four years, but nowadays it takes place every two years in Europe. This is also recommended for Albania. Since innovation studies have different approaches from R&D, it is strongly recommended to organise an independent study on R&D and Innovation in 2010.

3. The study on people with PhD degrees is essential for human resources. This analysis is new, both for UNESCO and Europe, and its first results are just emerging. It

No	Activity	Activity Description	Responsible Institution	Monitoring Indicators

includes gathering information on human resources and migrations, which constitute one of the main points of the Albanian case, and it is important to predict such an analysis in the near future. Gathering information on the Albanian diaspora from OECD countries' analyses may also be a useful contribution to national policies.

The work started with UNESCO funding regarding statistics shall be continued into the future. This will include the creation of capacities and know-how at the Albanian Institute of Statistics, in order to conduct such surveys and send reports to international statistics bodies related to the Ministry of Education and Science regarding the development of capacities, so that statistical data may be analysed and used in the development of policies.

Annex 1

Action Plan for the implementation of the national Science, Technology and Innovation Strategy in Albania, 2009- 2015

		1. Establishment of national priorities in the field of research		
1	Analysis of existing capacities in public administration and development of new expressions necessary to take studies forward (prediction, technology guide, evaluation of technology)	The objective of this activity will be to evaluate existing capacities at the Ministry of Education and Science in order to initiate and advance studies. Based on the evaluation results technical assistance shall be provided in order to ensure that the Science Directorate at the Ministry of Education and Science will be well prepared to manage effectively the process of drawing and implementing such studies in the future.	Ministry of Education and Science	− Independent evaluation r capacities and training nee administer prepared, subm accepted studies by the cor authority. −The offered technical assi training include the evalua quality of services offered beneficiaries
2	Selection of actors on which detailed studies shall be conducted	The aim of this activity is to select strategic sectors from those identified in the National Development and Integration Strategy and during the preparation of the National Science, technology and Innovation Strategy (2009-2015), which shall be submitted to detailed analysis. Under the light shed by the importance of the top-down approach in establishing priorities in scientific research, after the consultation process a decision shall be made regarding the selections of sectors that will be analysed in greater depth	Government decision/ Ministry of Education and Science (lead the consultation process)	− the consultation process and analysed − The decision is made tak consideration the results of consultation process for the shall be evaluated in detail
3	Evaluation of the potential of research & development potential and establishment of priorities in the strategic sectors of research.	Procurement contracts in order to determine concrete fields within strategic sectors, such as nutrition, energy, biotechnology, for which there is reason to believe that Albanian has the right scientific potential as e precondition for the concentration of funding in research and the creation of specialized infrastructure.	Ministry of Education and Science (in partnership with other ministries according to cases)	− Detailed evaluation in or determine the "technology regarding sectors for which contracting authority has p submitted and approved sp analyses
		2. Structure of the implementation of the policy of the technology and Innovation Strategy		
4	Scientific research infrastructure fund	Inventory of existing research infrastructure and the report of the evaluating expert: 1-3 international experts on the strategy of the research infrastructure will conduct an evaluation. This will serve as fundamental study for the programme.	Ministry of Education and Science (Albanian Research Agency)	− Report of the study that de figure of the general investm in the field of research/instit − Making the financial deci the needs of the programme government and identified d
		Projects of preliminary identification: every year, staring in 2010 there will be a call for expression of interest in the form of a preliminary application of 3-4 pages. Selected projects will be awarded a grant that will serve for the preparation of the full proposal.	Albanian Research Agency	− Selection of preliminary p will pass to the stage of full be analysed by a commissio includes at least 1-2 foreign plus Albanian specialists of research − mall grants by the MES/A the drawing of the detailed p
		Full proposals: submission of full proposals in order to confirm the project's investment in research infrastructure importance and feasibility: e detailed plan of the project that includes measures for management and	Albanian Research Agency	− Opening of the campaign submission or proposals and management of rendering pr − The complete proposals sh selected by a commission of

		coordination, the financial plan, monitoring and auditing.		composed at least at 50% by experts.
		Accomplishment of the project and monitoring: the aim of this phase is to install equipment, renew buildings and achieve expected results (the scale of use of equipment, etc.), manage available resources and monitor and report on progress made.	Project coordinators Albanian Research Agency	− Publication of the procure and the call for participation tender to beneficiary researc institutes − Separate projects have sta under way process and well (annual progress reports and reports) − The annual report regardi accomplishment of the prog submitted to the ARA board
5	Creation and development of Albanian Centres of Excellence in Science (ACES)	Beginning of the programme: the expert advises and similar schemes in other countries are examined, in order to establish procedures and criteria of the programme in the Albanian context. This study must include international experts.	Ministry of Education and Science (Albanian Research Agency)	− Documents of the program approved by the board of the Research Agency − Making the financial decis the needs of the programme government and identified d
		Projects of preliminary identification: every year, staring in 2010 there will be a call for expression of interest in the form of a preliminary application of 3-4 pages. Selected projects will be awarded a grant that will serve for the preparation of the full proposal.	Albanian Research Agency	− Preliminary selection of p the phase of complete proje commission that includes at foreign experts. Besides Alb specialist in scientific resear − A number of grants to cov drawing of the detailed proj by the MES/ARA
		Full proposals: submission of full proposals that cover aspects such as the managing and judicial structure, partnership rules, the detailed description of the research programme that will be conducted and objectives to be reached (PhD Studies, research results, etc.), the financial plan, and measures for monitoring and auditing	Albanian Research Agency	− Launching of the call for p and the management of tend procedures − Complete proposals select commission of experts comp least 75% foreign experts.
		Project accomplishment and monitoring: project achievement, acquisition of small equipment or materials needed for research projects, for training and management activities, including reporting to the ARA.	Project coordinators Albanian Research Agency	− Separate projects are well (annual progress reports and reports) − Progress analysis reports (decisions are made regardin continuation or not of furthe by international evaluators. − The annual report regardi accomplishment of the prog submitted to the ARA board
6		The analysis of the results of the current initiative “Brain Gain” and the drawing of the new, detailed programme, which takes into consideration best international practices. International experts must also take part in this study	Ministry of Education and Science (Albanian Research Agency)	− Documents of the program approved by the board of the Research Agency − Making the financial decis the needs of the programme government and identified d
		Management of the database of empty positions from scientific researchers in relation to the new research infrastructure, to the centres of	Albanian Research Agency	− A number of scientific res positions open and become − % of positions filled and g

	Eagles' grant programmes on research	excellence or other positions in the framework of the research strategy at universities' research centres or scientific research centres. Delivery of the grants' scheme for young researchers that return to the fatherland.		
		Management of annual calls for scholarships for PhD and master studies abroad for young scientific researchers.	Albanian Research Agency	− Number of earned Master degrees − % of students that return t after studying abroad − Returned researchers that Albania after the completion period − Annual report on the impl of the programme, submitte board of the Albanian Resea
		Monitoring of the programme's progress and preparation of annual report.	Ministry of Education and Science (Albanian Research Agency)	− Approval of the priority fi national programmes on tec NCSI − Documents of the program approved by the board of th Research Agency − Making the financial decis the needs of the programme government and identified d
7	National Programme on Technology	Beginning of the programme: the expert advises and similar schemes in other countries are examined, in order to establish procedures and criteria of the programme in the Albanian context. This study must include international experts.	Albanian Research Agency and related ministries	− Approval of the priority fi national programmes on tec the NCSI − Documents of the program approved by the board of th Research Agency − Making the financial decis the needs of the programme government and identified d
		Start of calls for proposals regarding the first national technological programme, and the selection of proposed projects by a consortium of research institutes and enterprises (including cases when foreign organization are permitted to take part)	Albanian Research Agency and related ministries	− The number of projects se funding − The number of projects th partners from the business s foreign partners
		Start of calls for proposals for 1-2 programmes, based on the results of the experience of the first programme	Albanian Research Agency and related ministries	− Same
		Project accomplishment and monitoring: project achievement, open to the media, acquisition of small equipment or materials needed for research projects, for training and management activities, including reporting to the ARA.	Albanian Research Agency and related ministries	− The number of projects th accomplished research activ − The number of research re exploited commercially, pro or used as a basis for further projects or applied research
8	Awareness building and incitement programmes in science, technology and	Beginning of the programme: the expert advises and similar schemes in other countries are examined, in order to establish procedures	Ministry of Education and Science	− Programme documents ap the ARA board − Making the financial decis

	innovation	and criteria of the programme in the Albanian context. This study must include international experts.	(Albanian Research Agency)	the programme needs (the g and identified donors)
		Procurement or the call for projects for activities that incite interest and improve the understanding of the importance of STI for the Albanian economy and society. The call for projects must be open to media companies, NGOs, schools. It is possible to predict specific activities of the Academy of Science in order to spur the improvement of the quality of scientific publications, or to incite results of scientific research in Albania.	Albanian Research Agency	− Selected and funded proje support STI incitement of y people, the business sector,
		Project accomplishment and monitoring: project achievement, open to the media, acquisition of small equipment or materials needed for research projects, for training and management activities, including reporting to the ARA.	Albanian Research Agency (Academy of Science)	− The number of participant activities, the number of sub publications, traffic indicato internet sites, etc.
	3. Strengthening of policy making capacities			
9	Creation of the National Council of Science and Innovation (NCSI)	Creation of a secretariat of the NCSI and the approval of the government's decision for the creation of the council, including the allotment of the budget for administrative costs until 2015.	Government decisions Office of the deputy prime minister	− The NCSI is formed and h operate, especially with a de secretariat with at least two budget to accomplish its res − The annual report of the N presented to the governmen parliament: "State of researc innovation in Albania – ann report".
10	Offering of the training and assistance programme for the Science Directorate at the Ministry of Education and Science	The objective of assistance is to strengthen capacities of the science directorate in order to guarantee that the staff is well trained and prepared to fulfil its daily responsibilities related to the secrecy of research policies, policy making, relations to other horizontal fields, and the evaluation of the scientific research policy. Support, through a programme of technical assistance, shall be also given to the new staff of the NCSI secretariat.	Ministry of Education and Science / Office of the deputy prime minister	− Technical assistance is off quality is evaluated for each the beneficiaries, meaning th the science directorate and t of the NCSI.
	4. Creation of suitable capacities for programme management			
11	Creation and functioning of the Albanian Research Agency	Drawing of the full business plan of the ARA regarding the period 2010-2015, based on the "Concept Document" approved by the government and the recruitment of the leading committee	Office of the deputy prime minister	− Business plan for the year drawn and approved by the board of the ARA
		The ARA initial phase includes the recruitment, drawing and initiation of the first programmes. Support for the initial phase is provided by a technical assistance project (to be confirmed, requires EU support).	Albanian Research Agency	− ARA created by governm − Financing of disbursed pr and… − Annual work programmes by the supervision board of
		The ARA is fully functional. The annual	Albanian	Annual reports approved by

		process of approval of the work programme by the supervision board of the ARA and the approval of the previous year report. The intermediate independent evaluation must be planned in 2013.	Research Agency	supervision board of the AR − Intermediary positive eval (2013)
		5. Improvement of the legal framework in policy making and research fund raising		
12	Compliance of the legal framework on STI with the EU legal framework and practise	Analysis of current laws related to science, technology and innovation, including state aid, scientific researchers' mobility, intellectual property rights, etc. The analysis shall be conducted by a team of experts that will report to the ARA. The required rewriting of existing laws and regulations or the drawing of new legal proposals shall be conducted by competent ministries or the parliamentary commissions with the technical assistance of the team of experts.	Government decision Office of the deputy prime minister	− Technical assistance and l drafts given for legislative a − Government decisions and parliamentary approval of le changes − Report on the effective accomplishment or impleme the new legal framework by ministries or other authoritie after the approval of the new framework)
13	Improvement of institutional and leading procedures of organizations dealing with scientific research	Analysis of capacities, procedures and internal regulations that influence scientific research activities of researchers (internal career and the system of stimuli) and the management of scientific research products (IPR) at universities and other research institutes. Technical assistance for the development of strategic research and development plans of universities and centres and the adaptation of the institutional framework.	Ministry of Education and Science, Universities and other research institutes	− Number of research organ supported by experts of tech assistance − Number of organizations t medium term research and d strategic plan − Effective implementation to institutional rules, stimuli career of scientific researche for IPR management, etc.
		6. Approval of a suitable budget framework		
14	Mobilisation of international donors in support of the STI (science, technology and innovation) strategy	Organisation of the donors' conference dedicated to the implementation of the STI strategy	Office of the deputy prime minister	− Engagement of the Albani government in drawing a mu budget framework for the implementation of the STI s − Funds promised by donors funding of special elements strategy
15	Albania's integration in the EU and funding received through EU initiatives in the Western Balkans, such as ERA-NET, etc.	Participation of experts from Albanian authorities and agencies in EU funded networks, aiming ensuring additional funds for the development of the policy on science, technology and innovation, the development of common research infrastructure, improvement of statistics, etc.	Ministry of Education and Science, Albanian Research Agency	− The number of participant networks or projects (co-) fu European Commission in re European research Area, and the Western Balkans, grows − ensured funds for Albania organizations/experts that ta such projects
		7. Placement of procedures and monitoring and evaluation procedures		
16	Establishment of a preliminary boundary of the research performance at public research institutes	The objective is to establish the preliminary boundary for the evaluation of scientific research performances within public research institutes, including higher education institutions, in order to measure their progress	Ministry of Education and Science (Albanian Research	− A polling instrument is di public research institutes an collected and analysed.

			Agency)	
17	Drawing and implementing the proposed methodology and the evaluation of the technical assistance contract	Technical assistance to raise capacities and skills at the Ministry of Education and Science for the preparation, monitoring and evaluation of the National Strategy on Science, Technology and Innovation. The Albanian government must engage the required resources in order to guarantee that the Science Sector at the MES is fully staffed.	Ministry of Education and Science	− Drawing, presenting and the monitoring and evaluati methodology − A seminar is held in order consultations between respe regarding the monitoring an methodology. Participants e quality.
18	Improvement of science, technology and innovation statistics	Based on results of initial pilot polls supported by UNESCO in 2009, the INSTAT, the MES and other ministries will continue to produce preliminary statistics that permit the integration of Albania in European and international statistical databases on science, technology and innovation. Further support from UNESCO or EU funded projects will be required to accomplish this activity.	Ministry of Education and Science, Statistics Institute.	− Production and publicatio principal science, technolog innovation statistics accordi standards that enable their i the main international and E databases.