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COUNCIL OF MINISTERS



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National Strategy of Science, Technology and Innovation 2009-2015



August 2009



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PREFACE

Dear Reader,

I have the pleasure to present the Crosscutting Strategy of Science, Technology and Innovation (SSTI), the first document of this kind that represents the long-term platform of research and innovation development in our country for the period 2009–2015.

Albania's high-paced economic and social development and the progress achieved in the process of NATO membership and European Union accession necessitate strengthened role of science, technology and innovation in our society. These factors are fundamental to a knowledge-based economy and essential to coping with the major challenges lying ahead in a global and growingly competitive world.

This strategy defines a clear vision and a number of important objectives which are harmonized with the objectives of the National Strategy for Development and Integration, with those of the Higher Education National Strategy and other sector strategies. It is a clear indication that the current government commits priority to research, science and new technology alongside higher education.

SSTI and the relevant action plan comprise a valuable guide for the work of Albanian policymakers, university executives, academics and researchers to give their contribution in the implementation of tasks and achievement of Strategy objectives.

I would like to take this opportunity to extend my cordial thanks to those who contributed to drafting this Strategy, employees of the Ministry of Education and Science, the Department of Strategy and Donor Coordination (DSDC), university staff, academics, and specialists of line ministries and other agencies who enabled the collection of information and gave valuable comments and suggestions.

Special thanks go to UNESCO Regional Bureau for Science and Culture in Europe (BRESCE) experts who provided support and technical assistance to produce these documents.

Endorsement of this strategy is an important step and we are aware of the substantial work needed for its implementation. Therefore, I invite all stakeholders to join their efforts in accomplishing our common goals in this field, which is both beautiful and important, with the view of ensuring accelerated and sustainable development of Albanian economy.

Deputy Prime Minister



ABBREVIATIONS AND ACRONYMS

ACES	Albanian Centres of Excellence in Science
ALPTO	Albanian Directorate of Patents and Trademarks
BIC	Business Innovation Centre
CARDS	Community Assistance to Reconstruction, Development and Stabilization
CHES	Council for Higher Education and Science
CIP	Competitiveness and Innovation Programme
COST	European Cooperation in Science and Technology
CSPTD	Council for Science Policy and Technological Development
EEN	Enterprise Europe Network
EPO	European Patent Organisation
ERA	European Research Area
EU	European Union
EUREKA	European network for market-oriented, industrial Research & Development
FP	Framework Programme
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
IPA	Instrument for Pre-Accession Assistance
IRC	Innovation Relay Centre
IPR	Intellectual Property Rights
MES	Ministry of Education and Science
NSDI	National Strategy for Development and Integration
OECD	Organisation for Economic Cooperation and Development
STI	Science, Technology and Innovation
RI	Research Institutes
R&D	Research and Development
RTDI	Research, Technological Development and Innovation
RTIA	Research, Technology and Innovation Agency

UNESCO	United Nations Educational, Scientific and Culture Organisation
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organisation
UNDP	United Nations Development Programme

PREAMBLE

Science, technology and innovation (STI) are essential to a knowledge-driven economy and are important at all stages of development, albeit in different forms or modes. Capacity to undertake scientific and applied research, to transfer and introduce new technologies into economic structures and diffuse them in society to creatively develop new products and services (product and service innovation), as well as through marketing, design and organisational change (non-technological innovation), is fundamental to national competitiveness. The European Union (EU), which Albania aspires to join, has set clear objectives related to research and innovation as part of its 'Lisbon Strategy': to make the EU the most competitive economy in the world. Albania, like other Western Balkan candidate and potential candidate countries¹ has lagged behind due to the need to find the right "foundations" for growth (through education, legal frameworks, poverty alleviation, etc.). However, the time has come to invest more in the creation, diffusion and application of knowledge if Albania is to meet its long-term development goals.

The need for a STI strategy in Albania was recognised by a wide range of decision makers and was placed on the policy-making agenda resulting in the formulation of this Strategy led by the Deputy Prime Minister.

This strategy was developed by the Ministry of Education and Science (MES) assisted by UNESCO experts and was coordinated by the Department of Strategy and Donor Coordination (DSDC) at Council of Ministers. It was also consulted with an extensive number of specialists and experts of line ministries and the "science community".

It is important that the ownership of the Strategy is as wide as possible and that the need for on-going STI investment is accepted across society and political actors. Countries with a successful track record in STI investment to boost economic competitiveness are all characterised by a well-grounded cross-party consensus that ensures constant policy-making commitment to a knowledge-based economy and society.

The Action Plan detailing operational aspects of proposed measures for 2009–2015 complements this Strategy with a proposal for the establishment of an Albanian funding agency for research, technology, innovation.

¹ See Milica Uvalic, *Science, Technology and Economic Development in South Eastern Europe*, UNESCO-ROSTE Science Policy Series N°1, 2005

CHAPTER 1

Overview of present situation

1.1 Reform hitherto in the STI system

Albania is a small country, both in terms of size and population with relatively low income levels despite two decades of rapid growth. While progress in restructuring of economy and productivity growth is visible, competitiveness remains low and generally based on labour costs rather than high value-added products or services. In Albania there are about 430 large enterprises, 1580 medium enterprises and around 85 thousand small businesses.

Sector composition is heavily skewed towards low-technology activities (agricultural employment remains relatively high), while exports are low in both absolute and relative terms. An effective STI policy is necessary to enhance structural adjustments towards knowledge-based and value-added activities, as a complimentary to other measures on economic modernisation.

In 2006, the Albanian government undertook a comprehensive reform of the scientific research system. The prime minister appointed an expert group from the academic community which drafted a platform for reform based on a deep assessment of the research system. The recommendations of the expert group were analyzed by the Council for Higher Education and Science (CHES), and on this basis the government took several decisions to reorganise the Albanian network of scientific research institutions.

The main outcomes of this reform are summarised as follows:

- a) the Academy of Sciences of Albania was re-organised according to the model of many European countries: it now operates through a selected community of scientists organised in sections and no longer administrates research institutes
- b) the research institutes of the Academy were detached and integrated into the higher education system.

The institutions were established or re-affiliated as follows:

1) *three inter-disciplinary research centres:*

- Centre of Albanologic Studies
- University Research Centre of Energy, Water and Environment in the Polytechnic University of Tirana
- Geo-Science Centre in the Polytechnic University of Tirana

2) *two new faculties:*

- Faculty of Information Technology in the Polytechnic University of Tirana
- Faculty of Biotechnology and Food in the Agricultural University of Tirana

3) a new centre and new a department (as part of the Faculty of Natural Science of the University of Tirana)

- Applied and Nuclear Physics Centre
- Biotechnology Department

- c) Research Institutes (RIs) under the line ministries were re-organised and twelve Technology Transfer Centres and Agencies were created, having as their main mission the transfer of technologies and knowledge and provide expertise to policy-making in relevant fields.

Completion of the structural reform in 2008 with the integration of RIs of the Academy of Science and line ministries in universities, brought Albanian research system in line with those of most European countries in which higher education and research are integrated together, as a fundamental principle of modern science systems. Reorganisation of research produced a single modern institutional framework that sets the premises for accelerated development of research, technology transfer and know-how. Higher education institutions and new research, technology and knowledge transfer centres have started to design development strategies for research and innovation in the context of the institutional long-term development plan.

1.2 Science system and its component institutions

Science system in Albania includes the higher education, scientific research, knowledge and technology (innovation) development. As such it includes not only the public and non-public institutions of higher education and basic research, but also entrepreneurships operating in the field of research, development and innovation. Reforms initiated in the field of higher education and basic research aim primarily at integrating these two systems which so far have been entirely separate from one another, and which should be innovative and efficient in a small country with limited financial resources.

- a) *Higher schools* are academic & research institutions. Their mission, under the Higher Education National Strategy (2008) is to ensure adequate higher education, scientific research, development and transfer of knowledge and technology. The scope and level of scientific research among universities varies. Actually, there are eleven public higher schools and 17 private higher schools. The latter are “younger”, with the first being opened only six years ago. Nevertheless, some of these have shown potential even in the field of research.
- b) *National research centres* are research-oriented academic institutions whose mission is to carry out scientific research and provide extended university training in the second and tertiary circle of studies, and to develop and transfer knowledge and technology. The Centre of Albanologic Studies was established from the re-organization of the Albanologic institutes of the Academy of Sciences.
- c) *Public Centres/Agencies of technology transfer and development* have the mission of carrying out development studies and projects and of transferring knowledge and technologies to production lines and service delivery. The following centres/agencies operate under their relevant line ministries:
- 6 centres/agencies in the Ministry of Agriculture, Food and Customer Protection
 - 1 agency in the Ministry of Environment, Forests and Water Administration
 - 1 centre in the Ministry of Tourism, Culture, Youth and Sports
 - 2 centres/agencies in the Ministry of Economy, Trade and Energy
 - 2 centres in the Ministry of Public Works, Transports and Telecommunication.
- d) Centres/agencies/institutes and other private entrepreneurships dealing with research and technology and knowledge development and transfer.

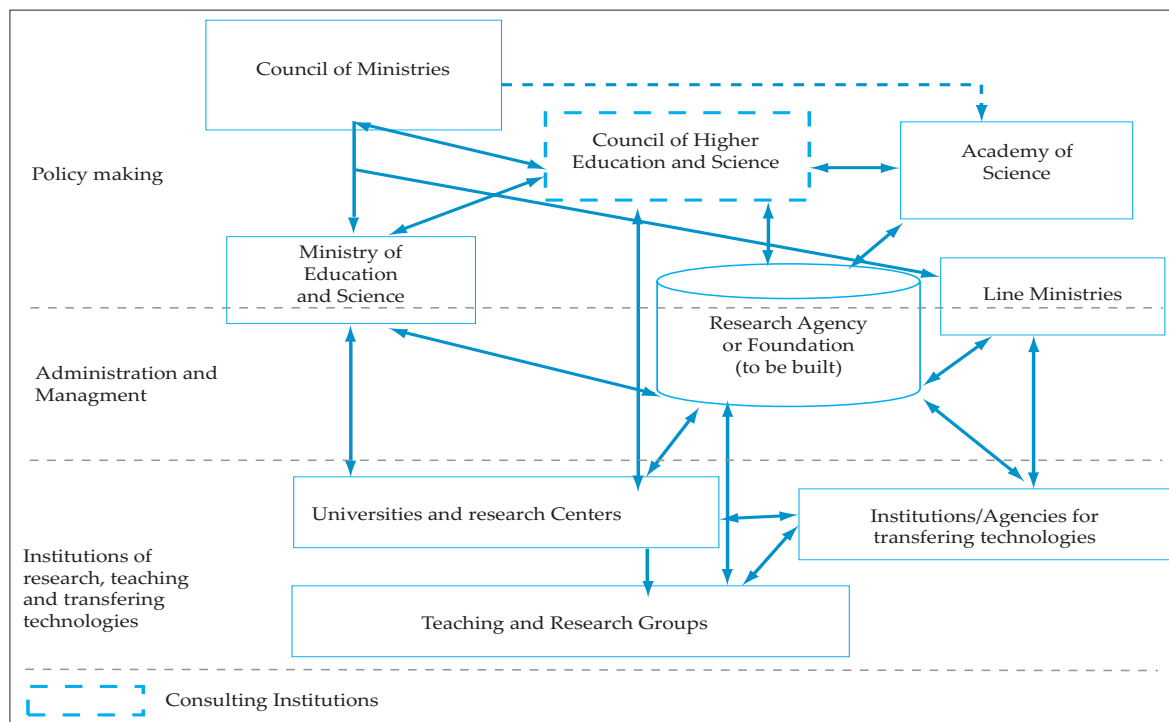
These are still in their early steps of development, but show quite a positive trend. There exist some similar, private organisations in the form of institutes or NGOs with a clear profile of competencies in certain areas, particularly in conducting risk analysis of social and economic matters, serving as a basis for policy making. This segment of the research and development

system has provided good support for policy-making, executive and legislative bodies. The number of private entrepreneurs involved in information and communication technology in the field of technology and knowledge development and transfer has increased recently. But similar initiatives in other important areas of economic and social development are scarce. For instance, there is limited private initiative for studies in energy, agriculture, molecular biology, biotechnology, natural resources and other areas.

Nevertheless, it should be noted that development of private entrepreneurship involved in development and transfer of technology and research has been in any case faster than that of public institutions, due to the absence of stimulating financial mechanisms for researchers and to the lack of a genuine reform of public science institutions.

The current science system structure in Albania is shown in Chart 1.

Chart 1. Science system in Albania following the institutional reform of 2008



1.3 STI system capacity and performance

Capacity and competence to manage both basic and applied research in Albania are limited and generally far from standards that would enable co-operation and participation in European or international programmes. Equally, scientific infrastructure is outdated and inadequate to support quality research. A sustainable investment programme is needed to ensure minimal scientific equipment and facilities (i) for university training across all scientific fields (ii) and to develop new profiles and upgrade existing ones with the aim of building national and international co-operation. An initial investment of \$4.9m was made with the support of the World Bank, but amounts committed remain small and are focused on teaching laboratories. From a cost-efficiency point of view, there is a need to align a national scientific infrastructure investment plan with investments being made at a regional (Western Balkans) level to permit sharing of equipment and infrastructure.

At present, it is difficult to make a precise estimate of STI investment levels, the performance of public, academic and business organisations that conduct research, or of the “innovation system” in general. R&D and innovation statistics are collected not in line with international (OECD,

Eurostat or UNESCO) standards².

A first survey of public and academic institutes was launched, in the first quarter of 2009, and a business R&D and innovation survey will be launched by summer 2009. Both these surveys are supported by UNESCO. For this purpose, a memorandum of understanding was signed between MES and INSTAT concerning provision of statistical information through observations - mainly research related - and diffusion according to best practices.

In terms of investment, estimates, corroborated during discussions for the preparation of the strategy suggest that annual Gross domestic expenditure on R&D (GERD) amount to around 15 million EUR in 2009, i.e. less than 0.2 percent of GDP. This expenditure is almost exclusively funded by the public sector and by foreign sources. The government is committed to increasing funding for higher education and scientific research. In this view, the 2009 budget is 2.2 times higher than in 2005. For the first time, the higher education budget reached \$112.4 million in 2009, of which \$5.6 million are for 'institutional funding' of scientific research (compared to \$800,000 in 2005)³. Actually, the only 'research-funding' programme is a small scale competitiveness funding programme (currently 132 projects for a total budget of \$5m, implemented over 2–3 years) run by MES. As noted above, the World Bank has also funded the equipping of teaching laboratories.

Under the medium-term plan (2008–2009) of the Brain Gain Programme, the Albanian Government for the first time committed State budget funds and opened 550 vacancies in higher education and scientific research institutions. To date, 82 assistants and lecturers with a MA or PhD degree have been qualified and appointed through open competitions in public and private universities. In 2007, the Albanian government introduced a programme for PhD studies, 'The Excellence Fund', which supports partially or fully the best PhD candidates to complete PhD studies abroad. A total of 27 PhD students were supported by this fund during 2007–2009.

Government funding for research is also channelled a number of line ministries and public organisations directly or indirectly involved in research and innovation policies or activities.

These particularly include:

- The Ministry of Agriculture funds activities in the field of applied research and technology transfer in specific areas, mainly in response to the needs of the farming community. Activities are carried out by five Agricultural Technology Transfer Centres (ATTC) under the ministry. The ministry has a consolidated extension programme implemented in co-operation with ATTCs and other research bodies⁴.
- The Ministry of Defence envisages the intensification of R&D activities for security and defence as part of a long-term development plan for the Albanian Armed Forces until 2020. Moreover, NATO membership implies involvement in the Science for Peace and Security Programme⁵.
- The Ministry of Health has its own research agenda focused on the improvement of health services.
- The Ministry of Economy supports two big agencies (National Agency of Natural Resources and the Albanian Geological Survey) which conduct and provide studies and services in the areas of natural resources, energy etc. This Ministry is planning to establish a Centre for Innovation that would provide enterprises with services related to innovation and technology transfer.
- Ministry of Environment, Forests and Water Administration has a programme that allocates grants in relevant areas.

The limited number of scientific publications and patent levels confirm the low level of output of the research system. There are no data or studies available that allow for any estimate of the extent

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 Statement of the Advisor to the Prime Minister on Educational Matters, Prof. Myqerem Tafaj, 6 December 2008

⁴ ATTC are new structures, under the Ministry of Agriculture, Food and Consumer Protection, established as the result of restructuring of the former research institutes of the ministry (Decision of the Council of Ministers No. 515, 19.07.2006)

⁵ www.nato.int/science/studies_and_projects/country-reports/ALBANIA-Country-Report-Feb09-update.pdf

of innovation activity (e.g. innovation expenditure) or outputs in the enterprise sector (e.g. sales of innovative products or services). Innovation in other developing countries is characterised by a relatively high investment rate in information and communication technology and innovation through acquisition of embodied technology and organisational change, rather than formal R&D.

A similar picture could be expected in Albania, with most enterprises requiring first and foremost advice on best-available technologies and related organisational change in production processes and training of staff. A limited number of medium and large enterprises as in the agro-food sector would potentially become actors in terms of investment in R&D enhancement. Until the university sector develops the required capacity and infrastructure to carry out advanced research, there will be few opportunities to develop high-tech initiatives/start-ups and investment in high-tech incubators.

1.4 Legal framework and decision-making process

The legal framework governing STI issues has evolved notably in the last few years, through the adoption of the 2007 Law on Higher Education and the Law on the Academy of Sciences (2006, as amended). A 1994 Law on Science and Technological Development was amended several times and needs to be revised to ensure compatibility with international standards and to ensure the opening of national programmes in line with EU priorities, State funding rules for R & D and innovation and animation of researchers, etc.

The 2007 Law on Higher Education introduced greater flexibility and objectivity in university funding, while the Higher Education National Strategy sets out a number of ambitious goals to improve the functioning of the university sector. The primary focus of the Higher Education Strategy is on improving the quality of teaching at university and masters levels, but it also formulates a number of orientations concerning academic research, including doctoral and post-university studies. For instance, the HE Strategy highlights the inferior number of students in science programmes, mathematics and engineering (19% compared to approximately 25% in many countries in the region), or the need to bring PhD standards in line with those of the European Higher Education Area. These elements are clearly fundamental to the future potential of the Albanian research system to carry out high quality research comparable to international standards. Hence, the development of research potential in basic and academic research needs to be led by a phased approach with careful consideration over investments in infrastructure or research programmes.

The Council for Higher Education and Science (CHES) was created by a 2006 amendment to the 1999 Law on Higher Education. CHES was set up as an advisory body to MES and to the Council of Ministers. Its main role is to provide advice on strategies, policies and priorities (e.g. each university's proposed five-year strategic plan to assess its compatibility with this Strategy). The Higher Education National Strategy envisaged the setting up of a small but high level group for the Research Strategy under CHES. This selected group was entrusted to develop a research strategy and to monitor its implementation.

A major change was introduced in the research system through the amendment of the Law on the Academy of Sciences⁶ resulting in the integration of former institutes of the Academy of Sciences into the major public universities since 2007. As in other European countries, the Academy has a representative and advisory role concerning science rather than carrying out research *per se*.

Integration of former Academy of Sciences research institutes into the university sector and formulation of a research strategy within each institution will clearly take time. The consultation stage of this strategy showed that rectors, vice-rectors, deans and heads of departments in the

⁶ Law N° 9655 of 11.12.2006 as amended on 27.12.2007 and 07.07.2008

three main universities are only now beginning to lay the foundations for the development of strategic research management.

Actually, 'research policy' is administered through the Directorate of Scientific Research at MES. R&D activity is financed through the institutional funding by the government (Fund for Science, as a specific item in MES budget, section "higher education and science"). Financing is provided in the context of bilateral programmes and international cooperation initiatives. The latter has been introduced recently and is largely financed by donor funding, is thinly spread and may still be regarded at a pilot stage. This policy has not been generalised yet, despite visible efforts to concentrate resources and introduce competitive criteria.

In the last decade, MES has not developed the capacity to fulfil its policy-making and scrutiny role, or to implement the current, and certainly not, the future funding programmes foreseen by this strategy. MES policy-making capacity in the area of research is insufficient.

1.5 Albanian international and European cooperation on STI

The international dimension is crucial to ensure rapid integration of STI excellence and competence principles into the national research system. It would enable access to international co-operation and funding in this field. Albania has gained experience in international cooperation in extensive areas of socio-economic development and education through e.g., EU Programmes: Tempus Higher Education, Erasmus, "Quality and Equality in Education", supported by WB, CEB, EIB; an education development loan via the European Investment Bank's Innovation 2010 initiative, and multilateral cooperation with United Nations agencies (UNECE, UNESCO, UNIDO, UNDP). Co-operation in the specific field of STI is as yet more limited, though a number of bilateral research co-operation agreements are important symbolically if not financially in creating the basis for exchange and partnerships. Full participation in the EU's 7th Framework Programme of R&D (since 2008) is a first step in the gradual integration into the European Research Area (ERA) and opens up prospects of additional funding flowing into the research system in the medium term. It should be taken into account the possibility of funding the implementation of the Strategy through IPA. This strategy seeks to provide a framework through which the multilateral donors' forum and bilateral cooperation can contribute in a structured manner to the strengthening of Albania's R&D capacity.

A high priority in terms of internationalisation is the gradual adaption of a process similar to that of the EU Member States 'national reform plans', whereby the Albanian Government would make commitments on long-term priorities in the areas of research and innovation. This includes a quantitative estimation of GERD/GDP and identification of challenges and policies to address these in the short and medium term.

Countries including Estonia, Ireland and Slovenia can be used as role models for Albania: on the one hand they are of comparable size and on the other they have progressed very fast both in economic and research terms. Ireland, in particular, once the poorest and the most technologically underdeveloped EU15 member state, evolved rapidly into one of the richest with considerably more internationally competitive research capabilities.

At the same time, if Albania relies heavily on foreign funding, and in particular on the very competitive structure of the EU's 7th Research Framework Programme (FP7), this might lead to considerable disappointment as funding decisions are difficult to anticipate. On the other hand, relying exclusively on national funding and expertise is unlikely to lead to new frontier research, as the size of the national scientific community is too limited to provide for the whole spectrum of skills and experience needed. The virtuous circle – reinforcing competitive advantages in scientific research and creating the competence to access funding from FP7 – will help to reinforce national excellence.

CHAPTER 2

Vision, priorities and strategic goals

International experience suggests that it is important that there exists broad cross-party parliamentary consensus as to where Albanian science could realistically be in 8–10 years time (some countries also use 20-year horizons and systematic foresight exercises) and as to what broader socio-economic goals would benefit from the reallocation of public funds for science.

The vision of science, technology and innovation is anchored on the single most important resource for a knowledge economy: people. The government seeks to ensure that by 2015 Albanian scientists able to generate international-quality research in certain selected areas.

Achieving such a vision requires the following:

- improvement of basic research infrastructure able to support sufficiently university training at three levels (BSc, MSc, PhD levels)
- creation of scientific excellence in key research areas for our country
- education and retaining/attracting qualified people in the Albanian research system
- increased public understanding of science and an improved awareness of the role of innovation and new technologies for society and economy.

This can only happen through major and targeted funding, appropriate and modern policy management and gradual integration of the research system into the European Research Area (ERA).

In line with the National Strategy for Development and Integration (NSDI), which identifies an extensive number of priority sectors (energy, tourism, agriculture and agro-processing industry, IT, geosciences, etc.), the STI Strategy will focus on a few priority fields enabling concentration of scarce resources available to core groups of researchers able to attain a level of international recognition and excellence. This will not exclude other fields, since minimum capability in basic or applied research is needed to keep higher education teaching up-to-date or to provide services to enterprises or to respond to social needs. However, concentration is a prerequisite for excellence, as is recognised at European level.

Internationalisation and integration into ERA and the building of national competences are mutually reinforcing. Albania is committed to playing its role in European level research programmes and initiatives, in proportion with its financial means and strategic interests, and promoting participation of Albanian researchers in the EU's Research Framework Programme and integration into other European research initiatives (COST, EUREKA, etc.).

In addition, the business sector will need to be encouraged to modernise and improve its capacity to co-operate with and commercialise outputs of research carried out nationally, as well as bringing technologies up to international standards through purchase of advanced machinery, etc. (including related organisational change and training). Complementary measures to support Albanian companies in this process will be required, including support to innovation management and strategies in enterprises and manufacturing advisory services and technology transfer. In this respect, IPA funding will be mobilised wherever possible and access for Albania to the Competitiveness and Innovation Programme (CIP) will be pursued.

In order to gradually increase co-operation amongst various elements of the 'Innovation system', it will be important to work with organisations representing specific sectors of the economy to

enable them to motivate and raise awareness of their member firms about innovation. Similarly, training activities will be organised under the STI Strategy, aimed at building relevant basic skills and encouraging enterprises with technological know-how or R&D potential to work with higher education institutes on defining university curricula, and at a later stage, post-university and industrial research.

STI strategy visions for the Albanian STI system is:

“reaching of a crucial level of research to support university education in its three levels (BSc, MSc and PhD) as well as achieving excellence in a small number of priority areas by 2015, through the concentration of national and international resources and in close cooperation with Europe, as well as through the provision of systematic support for innovation and technology transfer to cater for the needs of the productive sector”.

While priorities of the excellence fund for basic and applied research in specific areas are set out, the production sector needs to improve and modernise its absorbing capacity of research output at national level, and to upgrade its technology to comparably international standards by purchasing advanced machinery etc. (and securing the relevant training). In this sense, complimentary measures supporting Albanian companies through this process need to be implemented, including support for management and innovation strategy of advisory services offered to enterprises and manufactories, as well as support for technology transfer.

2.1 Research priorities

Selecting priority fields of science is a very challenging task since the process implies designating a few key priorities on which financial resources are focused, while there is a natural pressure from actors outside those assigned priorities to redesign measures and include more areas into the priority budget. International experience indicates that the best approach when assigning priorities is to proceed with a combination of a bottom up and a top down priority setting. Orientation of research is normally done through a number of national research programmes that target fields selected as a priority due to their socio-economic relevance. Albania’s NSDI underlines the importance of modernising economic sectors such as the agro-food industry and tourism, as well as the strategic importance of energy, environmental and water resource management.

In parallel, proposals for prioritisation in fields of research have been made by the stakeholders of the research system in areas such as agriculture and food, information and communication technologies, public health, Albanology and human studies, natural resources, biotechnology, biodiversity, defence and security.

Strategic management of the research system and informed and objective selection of national priorities will require developed capacity to carry out forward-looking studies (foresight, technology road-mapping, technology assessment) through or at the request of the consultative bodies advising the government and parliamentary committees.

Equally, it is important not to stick to only top down pre-selected topics, nor overly broaden them, unless additional funding is secured. A structuring of research potential through competitive calls for proposals that incite researchers to work together in inter-institutional and inter-disciplinary modes can allow for ‘own-initiative’ proposals to emerge from the research community.

A principal criterion for selecting research themes will be the demonstrated ability and potential to create a crucial mass of excellence in the form of groups of researchers working together on an agreed medium-term (five–seven year) research ‘road-map’. Based on international experience, the size and budgetary constraints of the Albanian research system allow for the creation of four or five centres of excellence, over a five-year period initially. But realistically speaking, this process

could take up to a decade for the centres to reach maturity. The development of such centres of excellence will be critical for improving the credibility and visibility of Albanian research within the ERA, and thereby will maximise the inflow of funds from EU research programmes (FP7, COST, EUREKA, etc.). The procedure for the development of such centres of excellence is set out below.

2.2 Goals and milestones

The above-mentioned vision and priorities need to be translated into concrete goals and milestones in order to allow for a systematic monitoring of progress and to help achieve the targets of the programme. The small share of R&D in the higher education sector is mainly due to the lack of direct financing over the transition period and of human capital available today. In the last 3-4 years, the Government has significantly increased budget for science and has launched programmes that foster human resource development in science (Excellence Fund and Brain Gain Programme). It is unlikely that the private sector will begin to invest in formal R&D in any significant way (in top performing countries the private sector contributes 2/3 of the R&D finance) but it will be a goal to develop structured product development and innovation activities in a limited number of firms.

Strategic goals are summarised or quantified below:

1. **Increase public spending on research to 0.6% of GDP by 2015.** A number of observers found this target too modest. However, it would represent a significant increase compared to the current situation. Equally, it would be a higher relative share than a number of less developed EU countries, some Western Balkan countries and many emerging economies⁷.
2. **Increase the share of gross expenditure on R&D from foreign sources** notably from the EU (FP, etc.) and international donors to cover 40 per cent of all research spending in the years 2010–2015.
3. **Create 4-5 Albanian Centres of Excellence in Science (ACES)** including dedicated laboratory equipment or workspaces that could be used for new technology based firms (pre-incubation, testing, certification, etc.).
4. **Double the number of researchers**, through 'brain gain' incentives and training of new researchers (establishment of graduate schools; train 500 PhDs). This will involve the creation, in synergy with the Higher Education Strategy action plan, of up to three new 'PhD schools' (or doctoral programmes) in Albanian universities. New PhD schools are planned to be opened this year with curricula and standards comparable to those stipulated in the Bologna Charter..
5. **Increase innovation activity in 100 companies** (this figure may be revised once the results from the first business RTDI survey are published) through investment in R&D through own laboratories, or via consortia with the academic RIs or in partnership with foreign partners.

⁷ 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.proinno-europe.eu/admin/uploaded_documents/EIS_2008_Global_Innovation_Scoreboard.pdf

3.1 Structuring policy implementation

It is proposed to structure the policy intervention to be developed over the six year period from 2010 to 2015 around **five main programmes**, in addition to the existing baseline funding on which efficiency savings may be made, as follows:

- A. *Research Infrastructure Fund* with the objective of improving the equipment and facilities available in the public and university research institutes to a level permitting research projects to be executed to international standards. This programme will be open to bids submitted by either individual research institutes or by a university as whole.
 - i. Examples include Croatian Research Equipment, Estonian R&D Infrastructure programmes, and, on a different financial scale, the Irish Programme for Research in Third-level Institutes, and Polish Support to Joint Research Infrastructures Programmes.
- B. *Creation and Development of Albanian Centres of Excellence in Science (ACES)* with the objective of developing 4-5 centres of excellence bringing together a minimum of 20 researchers (principal researchers, post-university researchers and PhD candidates) from at least two separately affiliated research institutes;
 - i. Estonian Science Excellence Centres and the Slovenian Research Group Financing programmes may serve as models.
- C. *Research Eagles Grants Programme* aimed at increasing the number of Masters and Doctoral graduates in science and engineering, carrying out post-university research or projects in Albania. This measure should be linked to the development of doctoral studies (schools) under the HE Strategy. The programme will fund both young researchers to undertake PhDs in Albania (as soon as doctoral programmes reach international standards) and mobility to pursue PhD training in the EU27, as well grants for returning researchers from abroad (including stipend and relocation support).
 - i. Lessons should be drawn from the pilot experience of the 'Brain Gain' programme, and a range of schemes in EU can be used as models, e.g. the Croatian Brain Gain, the Hungarian Eötvös Scholarship, Slovenian Young Researchers or the Flemish Odysseus programmes.
- D. *National Technology Programme* aimed at bringing together consortia of academic research institutes with the private sector or other public sector organisations (e.g. water or energy utilities) in order to develop a medium-term programme of applied research with a social or economic impact. The aim would be to launch at least one such programme in the period 2010–2015 and two or three more by 2020. For this reason it is important that the government sets up a **special fund** to stimulate companies in the fields of research and innovation. Experience of the Austrian technology programmes could be adapted to the specific context of Albania.

E. Science Promotion and Education Programme aimed at promotion of science towards young people and funding of a limited number of graduate schools to boost PhD numbers. Various science mentoring and ambassador schemes or ‘innovation awareness’ initiatives in the EU27 could serve as models. The Albanian Academy of Sciences, according to its new mandate, should be involved in this programme.

All of the above programmes will be administered on the basis of competitive calls for projects or applicants (in the case of individual grants for researchers’ mobility). For example, the centres of excellence programme will adopt the following procedure:

1. Launch a call for cooperation among research teams in the country (inter-institutional), who will present first an outline proposal indicating mainly the research theme. The proposals will be evaluated based on a) the potential strategic relevance of the research for Albania, and b) the critical mass of researchers being brought together from at least two research institutes/universities.
2. Select preliminary proposals to receive a grant to carry out a feasibility study and submit a full proposal for funding. A group of researchers and a strategic research plan for cooperation and targeted scientific achievements will be formed.
3. Select full proposals based on the quality of the strategic research plan and a number of specific selection criteria (publication record, relevance for national productive capabilities, international prestige, e.g. partners in EU countries, number of teams participating, milestones for attraction of international funding, links with graduate training, etc.).
4. Use an international panel of experts for selection.
5. Secure funding for six years for labour costs (including overheads), infrastructure (buildings), equipment, training (including study trips) related to the strategic research programme of the centre.
6. Be subject to an international peer review after three years and a full evaluation at the end of six years.

Moreover, the design and implementation of these programmes will require a considerable strengthening of policy-making and programme management capacity. There is a need to mobilise funding, including support of the EU or other donors, for the establishment and operation of a research programme management organisation (see section 3.2. below). The research programme management tasks will include administering the calls for proposals and project funding for scientific and applied (industrial) research and evaluating and certifying research institutes eligible for participation in the programmes.

The above set of programmes will not specifically target knowledge diffusion (technology transfer) or research commercialisation activities except as an expected impact of the research (e.g. the centres of excellence or technology programmes will ultimately contribute to developing or adapting new technologies). This is intentional. Evidence suggests that most Albanian enterprises are not in a position to begin co-investing into applied research and development or contracting advanced services. At the same time, the primary need is to build up a science base able to develop research excellence that may lead to results worthy of proof of concept (prototyping, etc.) investments. However, this is unlikely to occur within the initial five-year period.

Technology diffusion and transfer activities are, however, crucial in a transition economy such as that of Albania. Evidence from past reports and discussions held for preparing this strategy suggest that many of the researchers in both the former Academy RI system and universities are actively involved in ‘applied research’ or service provision related to specific economic or societal needs. There remains a need to professionalise and structure this flow of services towards enterprises and formalise, over time, the revenue stream such services can generate for the research institutes.

Equally, there is a need to ensure that Albanian enterprises are purchasing the best available technologies as part of their upgrading plans and to train workers in such technologies.

Indeed, the need is clearly present for the creation of a specific government funding measure to stimulate the companies in the field of innovation and transfer of new technologies. In this context, international experience shows that it is more effective to associate such financial support for technological upgrading with advisory services (the UK Manufacturing Advisory Service is a good example).

METE's proposal to establish a National Innovation and Technology Transfer Centre for this purpose is clearly complementary to the programmes proposed under the STI Strategy. Ideally, this could follow good practice examples from the network Business and Innovation Centres (BIC) and Innovation Relay Centres (IRC) developed in the EU over the last decade. The BICs and IRCs are now combined in the Enterprise Europe Network (EEN), funded under the EU Competitiveness and Innovation Programme; the Albanian Centre of Innovation should speed-up efforts to achieve admission in and support from the EEN programme.

3.2 Strengthening policy-making capacity

Strategic governance of research policies requires a range of skills, capabilities and organisations. At a minimum, the research policy and funding system need to be able to do the following:

- recognise the strengths and weaknesses of the system (policy intelligence)
- define the focus and topic of political action (agenda setting)
- ensure co-ordination of activities beyond the research policy field (horizontal linkages to other policy fields)
- implement policies cost-effectively
- learn from past experience (evaluation) or good practice elsewhere
- make adjustments to the whole policy cycle.

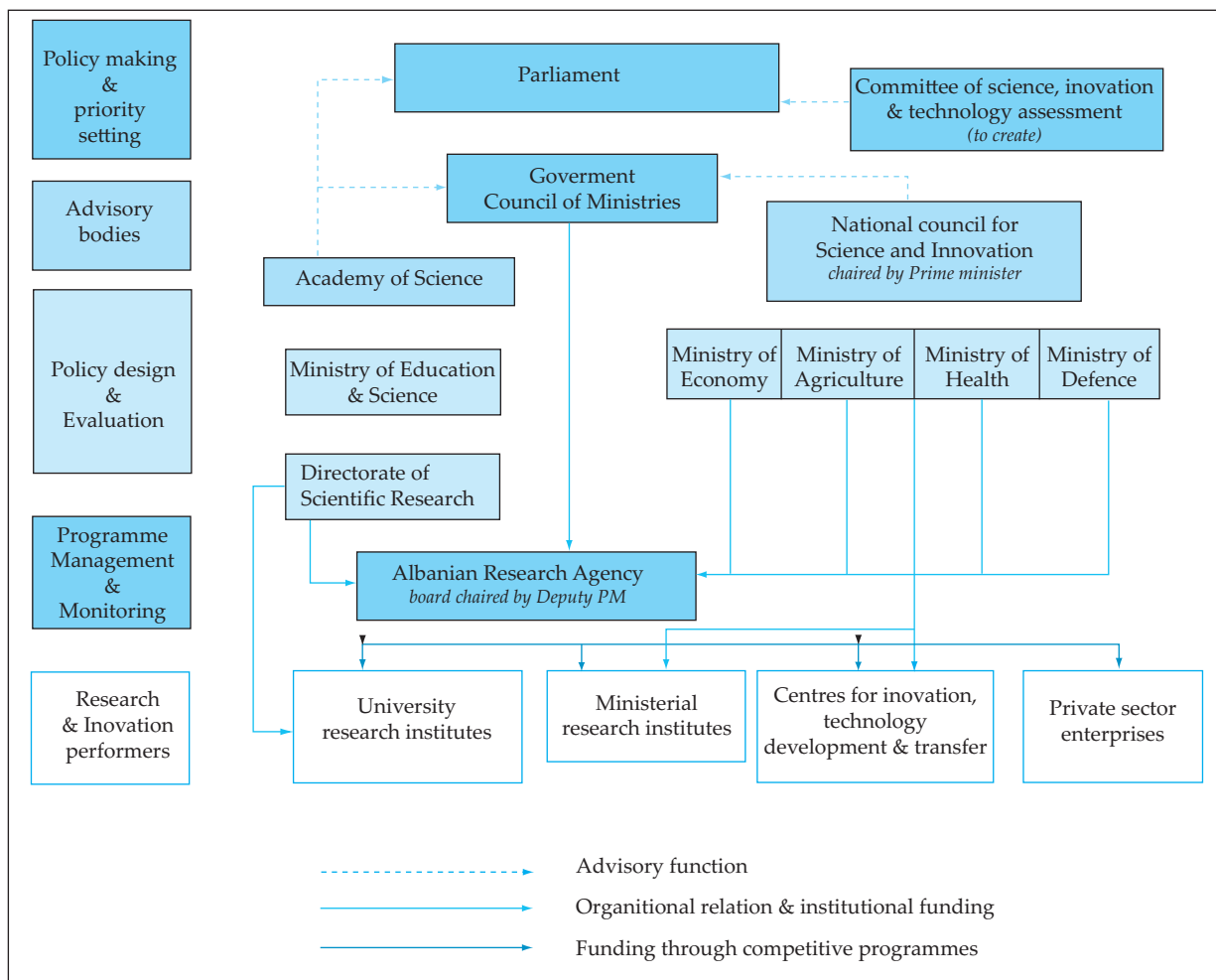
Clearly the current system in Albania is far from being able to meet these minimum conditions. There is a need for profound re-organisation and a clearer attribution of tasks. The Albanian Government is committed to improving the capacities and skills required to ensure the management of the detailed design and implementation of the STI strategy. The required skills can be broadly classed as follows:

- strategic and operational management of research and technological development (RTD) programmes
- systems and methods for carrying out the selection, monitoring and evaluation of such programmes and of projects funded
- techniques for appraising and accrediting of management and activities carried out by research and technology organisations (public, academic and potentially private), which are the direct beneficiaries of the programmes.

The responsibility for priority setting, overseeing, adjustment of research, technology and innovation policy cycle and budget ceilings should fall on the Strategic Planning Committee (SPC) and the Council of Ministers as the highest policy-making and decision-taking body. SPC is chaired by the prime minister. SPC meetings are attended by relevant ministers and representatives from lower-rank political levels and central institutions. SPC prepares policies through wide consultations and presents them for approval to the Council of Ministers. CHES advises the Council of Ministers on STI matters. For this purpose, CHES will include one or two representatives of the business community and one representative of the Ministry of Economy, Trade and Energy. CHES can set up a standing commission for technology and innovation. Enhanced CHES role requires strengthened CHES Secretariat capacity with at least two experts to support its work and with a budget for commissioning studies or policy learning (study trips, etc.).

Secondly, the functions of research policy intelligence (analysis and R&D statistics, etc.), policy making, ensuring horizontal linkages to other policy fields and evaluation of research policy need to be brought together in a department of government with a clear mandate and sufficient resources. A revamped Department of Scientific Research within MES could play this role and be staffed by four to six qualified experts and supported by a training or technical assistance programme.

The chart below sets out a simplified overview of the Albanian research system based on the assumption that the option of creating an Albanian Research, Technology and Innovation Agency (RTIA) is pursued. The funding flows assume that MES will delegate management of competitive funding programmes to RTIA and foresees that other ministries could do the same (e.g. for a national technology programme for the agro-food sector, the Ministries of Education and Science, Economy and Agriculture could all contribute funds via RTIA). The agency integrates activities of the Ministry of Economy related to innovation (e.g. the proposed Centre for Innovation) and for this reason it is named the Albanian Research, Technology and Innovation Agency (RTIA). Research, technology and innovation issues should be the scope of a Parliamentary Committee (probable a separate commission of education, science, technology and innovation). This proposal is represented below in the chart of science, technology and innovation system.

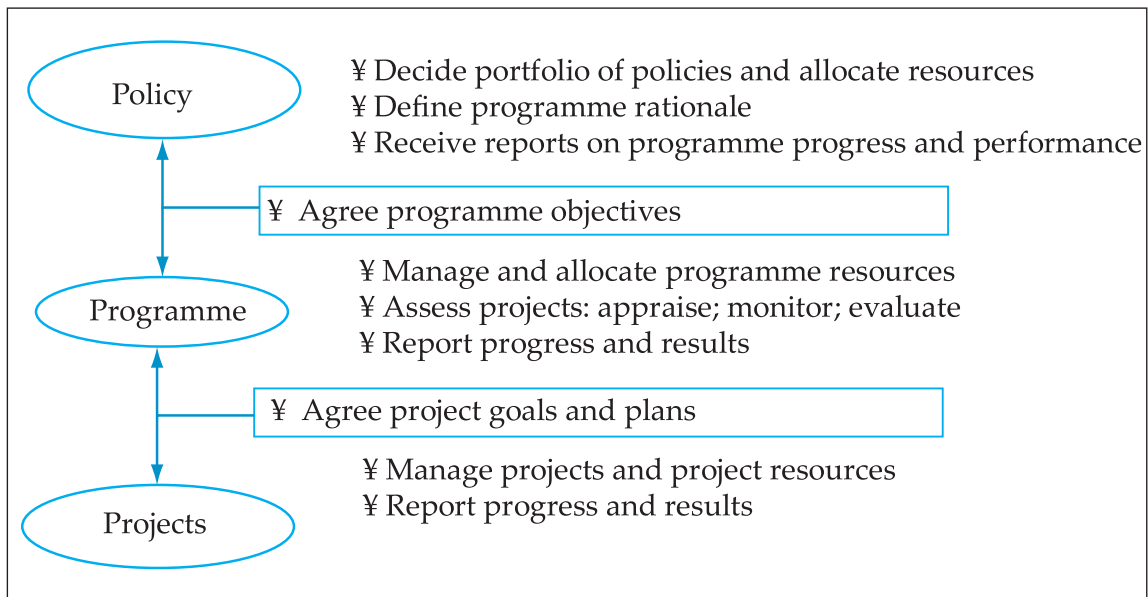


Most European parliaments have created a capacity in technology assessment to assist them in decision-making where there is a scientific or technological issue. The advisory role of the Academy of Sciences is reflected in the chart. The Academy could also be a recipient of funding from the ministries or RTIA for specific tasks related to scientific publishing, promoting public understanding of science, promoting scientific careers, library functions, etc. Such funding lines are not drawn for the sake of visual simplicity.

3.3 Creating appropriate capacity for programme management

The process of implementation of the STI strategy is conceived as a chain of **performance contracts**, which will link the progress and results of the individual projects (funding awarded to research institutes, individual researchers, enterprises, etc.) up through the programmes management and back to the policy-level in the ministries and government. Ultimately, the effectiveness of STI policy will be scrutinised by parliament (and hence the electorate). For the whole chain of performance contracts to work well, high quality is needed not only in the work done at each level but also in the agreements that link levels together.

Exhibit 1. Programme management as a hierarchy



Programme managers look after and allocate the programme's resources to a range of projects. This involves undertaking the following:

- appraising project proposals
- selecting projects to fund
- monitoring projects to ensure the progress planned is made and the desired results achieved
- evaluating project quality.

In order to keep the policy customers (beneficiaries) satisfied, programme managers need to report progress and results.

Programme objectives represent an agreement between policymakers and programme managers, so project goals and plans form the basis of agreements (often literally in the form of contracts) between programme managers and project leaders. The project level then has the detailed responsibility for project execution and for reporting results.

Evidence of programme management and evaluation from other European countries allows us to decompose the process model shown in Exhibit 1 into a large number of individual tasks. For example, the process of 'acquiring projects' can be decomposed as follows:

- *communicating* about the programme to potential participants
- acquiring high-quality proposals
- appraising proposals
- taking funding decisions
- establishing performance contracts with project leaders.

Each of these individual tasks is then further decomposed into a set of qualitative and quantitative **benchmarking indicators**, against which data are gathered on a programme-by-programme basis.

This logic of performance contracts raises the question of the organisation that should ensure programme implementation and the day-to-day management of research funding programmes in Albania. For this purpose is established the Albanian Research, Technology and Innovation Agency as an “implementing agency” for research funding mainly through competitive funding programmes, and as a counter-part for international and bilateral co-operation with similar research funding agencies elsewhere in Europe. This Agency shall be a contact point for EU support programmes dedicated to R & D and innovation.

3.4 Research, Technology and Innovation Agency

R *TIA is a public autonomous agency under the Council of Ministers.*
Mission

In line with the priorities defined by the Council of Ministers and under the direct supervision of the Deputy Prime Minister, RTIA supports, monitors and assesses STI programmes and projects at national level. For this purpose, it uses funds from State budget, international programmes and private sector earmarked for STI.

Main tasks

RTIA conducts the following main tasks:

- a) Enforces Board decisions concerning funding of STI programmes and projects, in line with priorities defined by CoM and evaluations conducted by assessment commissions;
- b) Develops procedures of application, initial evaluation, monitoring and final evaluation of STI programmes and projects;
- c) Monitors and assesses STI activity at national level;
- d) Establishes and enriches the database, analysis and documentation of STI system;
- e) Offers technical assistance to any institution with regard to STI investment;
- f) Promotes establishment of STI structures in all levels’
- g) Fosters cooperation with the private sector in STI;
- h) Promotes and offers expertise, coordinates and monitors bilateral and multilateral cooperation with the EU, individual countries and foreign organisations in STI;
- i) Cooperates with line ministries and other institutions for the implementation of the STI strategy.
- j) Provides technical support to the executive institutions and the legislative and other institutions to improve and complete the STI legal framework.

Participation of financing supporters in decision-making is ensured through their representation in the **Steering Board** as the **direct decision making body of RTIA.**

Composition of Board

The Board consists of:

- The deputy Minister involved with science, technology and innovation (Board Chair)
- 4 representatives appointed by the executive (deputy ministers of Economy, Agriculture, Finance, and Environment)
- 3 representatives selected from the science academic community;
- 1 representative of the business community.

The composition of Board is approved by Prime Minister Order upon a proposal of the deputy Prime Minister.

Main functions of Board include:

- a) Designs overall objectives of the Agency activity;
- b) Proposes to the deputy Prime Minister the budget proposal for RTIA activity and approves its revenue;
- c) Approved funding of STI programmes and projects in line with priorities defined by CoM and evaluations conducted by the assessment commissions, and authorises the general director of RTIA to signed contracts for this purpose;
- d) Assesses the Agency activity and approves a report that is submitted to the deputy Prime minister and is made public;
- e) Organises the competition for the position of RTIA general director and recommends 3 candidates to the deputy Prime Minister;
- f) Appoints directors of RTIA departments on the basis of merit-based competitions in line with the law on Civil Service;
- g) Endorses the assessment commissions in relevant science areas for programmes and projects;
- h) Reviews and analyses monitoring and evaluation reports of programmes and projects funded by RTIA.

General Director

RTIA everyday management is run by the **General** Director preselected by the Board and appointed by the Prime Minister pursuant to a proposal by the deputy Prime Minister.

3.5 Improving the legal and institutional framework for research policy-making and research funding

Albanian legal framework has been set out above along with the need for overhaul of the laws relating to research, technological development and innovation. Redesign of the overall legal framework is part of the process of Albania's integration into ERA and should include aspects related to the legal alignments required for European Partnership for Researchers (improving researchers' careers and mobility), joint programming, etc., as well as adjustment of Albanian laws to the EU's State Aid rules on R&D and innovation. Reasonably, IPA programme is the primary potential source for providing technical assistance to MES and this assistance helps capacity building of SPC, CHES and line ministries with funding for research, technology and innovation activities.

In terms of Intellectual Property Rights, Albania is not yet a member of the European Patent Organisation (EPO) and one of the few European countries not yet to have acceded to the European Patent Convention, though it has been invited to do so. Administration of industrial property is instead carried out by the Directorate of Patents and Trademarks (ALPTO) under the authority of the Ministry of Economy, Trade and Energy (since May 2006). Accession to EPC and EPO membership should be pursued as one of the objectives of this strategy. In parallel, there will be a need to amend Albanian laws and procedures and to develop support services to academic researchers and industrial enterprises related to both patents and other forms of IP right protection and management practices. RTIA should take measures to promote intellectual property right practices, specifically in academic institutes and the enterprise sector.

RTIA shall support extension of know-how and management of IPR, respectively for public/academic institutes and the enterprise sector.

Furthermore, priority should be placed to Albania's integration in European organisations such as full participation in the Competitiveness and Innovation Programme (CIP), COST and EUREKA.

An IPA-funded technical assistance project could develop a ‘one-stop-shop’ service with RTIA playing the national contact point for FP7, CIP and other programmes like COST and EUREKA.

3.6 Adopting an adequate budgetary framework

The budgetary framework for implementation of the STI strategy is set out for the period 2009–2015. All figures for future years should be considered as a working hypothesis at this stage. There is an assumption that actions in 2009 and first quarter of 2010 will be focused on the preparation of detailed programmes and creation of the management capacity of RTIA (assuming this is the preferred option). The table below indicates budget ceilings for Higher Education and Research in 2010-2012:

million \$ (exchange rate 1\$= 100 lek)	MTBP 2010-2012, ceilings approved		
(in million \$)	2010	2011	2012
Higher Education Institutions	112.2	118.4	145.5
Funds for Science	6.49	7.59	9.23
TOTAL	118.69	125.89	154.72

A basic assumption is made that the Albanian Government will progressively increase national public funding for both the existing baseline funding provided under the higher education budget and the ‘small’ research projects currently managed by MES, but which could be transferred to RTIA upon its creation. Based on budget planning and ceilings, research accounts for 0.2% of GDP; this figure includes the scientific research (separate budget item), research as part of HE budget and research funded also by other central institutions such as line ministries. The main goal is to bring research budget to **0.6% of GDP** increase it further.

The table below indicates funds committed to higher education and research for 2009-2015. Specific development and maintenance costs of laboratory equipment are included in the public HEI funds which are approved separately for each HEI, according to the budget detail formula; this means that around 8% of grand funds allocated to HIE will be earmarked for research and development. Funds approved for 2010-2010 are within the ceiling approved by DCM No 489 of 6.5.2009. In addition, pursuant to the law on public and non-public HEI, funds are committed for research, development and innovation activities with the view of integrating together the higher education system with basic research. Contributions from donors under FP7, IPA and others have been envisaged in the framework of international bilateral and international programmes.

Funds for science, technology and innovation (STI)

In the budget law, the section “Education”, subsection “Higher education” is related to the “Funds for Science”.

This budget line should be modified by “Funds for science, technology and innovation – STI”. During the budget preparation stage, line ministries should plan adequate funds for research, technology and innovation for the share they cover. STI is represented as a sum of budgets requested by all line ministries and is indicated in the budget law as a separate heading, as is the case with other national agencies (eg. Albanian Development Fund, INSTAT, etc.).

This budget line should be detailed in items that cover all STI activity. This approach ensures both the political will of the government and that of the parliament (since it is part of the budget law) concerning STI funding priority for a relevant period.

Funds for science, technology and innovation is transferred to RTIA to be executed in line with the priorities defined by the Council of Ministers and indicated in the budget law adopted by the Albanian Parliament.

Funds foreseen for higher education and research 2009-2015

Budget lines million ALL)	2009				2010				2011				2012				2013				2014				2015				Total 2009- 2012
	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	Total	State funds	Foreign donors	Non Public HEI	
Basic funding for research institutions HEI**	750	750			825	755		70	1,000	880		120	990	820	0	170	1,050	900	0	150	1,240	1,040	0	200	1,575	1,350	0	225	7,430
Financing of research projects (MES)	876	816	60		854	774	80		950	850	100		1,030	910	120		1,175	1,025	150		1,380	1,200	180		1,670	1,470	200	0	7,935
CBA	330	130	200		0				0				0				0				0				0				330
Funds for research infrastructure **MASH+	15	15			480	400	0	80	575	475	0	100	553	433	0	120	925	675	150	100	1,035	755	100	180	1,150	840	100	210	4,733
Albanian Centres of Excellence in Science	15		15		150		150		150		150		150		150		150		150		150		150		150		150		915
Albanian Grant for Research *	15		15		15		15		20		20		25		25		25		25		25		25		25		25		150
National Programme/s for Technology	0				0				15	15			200	200			200	200			200	200			200	200			815
Albanian Agency of Science and Research (MES)	25	10	15		50	15	35		50	15	35		50	15	35		50	15	35		50	15	35		50	15	35		325
TOTAL funds	2,026	1,721	305	0	2,374	1,944	280	150	2,760	2,235	305	220	2,998	2,378	330	290	3,575	2,815	510	250	4,080	3,210	490	380	4,820	3,875	510	435	22,633

CHAPTER 4

Evaluation and monitoring

4.1 Internal procedures and responsibilities

Policy-making needs to be evidence based. The first step to build up evidence is through evaluation that will feed into the revision and adaptation of priorities and policy implementation. Evaluation is both a culture and a demanding exercise. Countries that have decided to build an evaluation culture rapidly have done so by adopting the necessary legislation and making the budgetary provisions that allowed them to evaluate all major organisations and measures supporting research.

While there are many models to be discussed once a system is mature, it is important to start from the very beginning with some basic steps. These are outlined below.

A. Institutional evaluation

All organisations need to be periodically evaluated. Currently, universities are expected to be introducing evaluations in the context of the adoption of the Bologna process. Since this is going to happen, it is recommended to build into this evaluation several important questions that will help get a better overview of research performance in universities.

At a first stage, all universities and institutes should be asked to make an assessment of their own research infrastructure. The timing and exact process needs to be agreed in the context of the advancement of the Bologna process. The role of RTIA in the evaluation of research capacities of the scientific community needs to be specified carefully to complement the work done by the National Accreditation Agency on the teaching quality in higher education.

Non-university research centres will also need to be evaluated. It is suggested to use international templates for this but postpone the evaluation to a later stage, as other evaluations need to be given priority.

The selected centres of excellence mentioned above will be carefully monitored throughout the period they receive preferential support with performance indicators used in the top performing European countries.

B. Programme evaluation

All future programmes with a budget larger than 1,000,000 Euros should include a provision for evaluation, normally 1-3% of the programme budget. It is proposed to provide for a mid-term review and a final evaluation of the five proposed programmes. These evaluations should be commissioned by MES, or other line ministries funding the programmes, and will be based on the monitoring data and on-going review of projects to be managed by RTIA. The mid-term reviews could involve a report by RTIA on project implementation and progress to CHES, complemented by peer review of the scientific progress. However, an *external Expert Team* should be commissioned to carry out the final programme evaluation by MES with a Supervision Committee of representatives of other Ministries, etc., to ensure independence of reporting and provide a basis for revision of programmes in the post 2015 period.

Moreover, at the end of the current strategy period, it is foreseen that a full review of the strategy

will be carried out; this should be commissioned by the deputy Prime Minister on behalf of NCSI that will act as a sounding board for the strategy review.

C. Organisational arrangements

As in the initial phase evaluations can be launched individually it may be of interest to study the Austrian 'Platform Evaluation' scheme and foresee a similar forum for Albania. When more programmes will be operational an independent organisation might be necessary to coordinate evaluations (e.g. the planned Agency). However, in order to maximise the benefits and help train people it will be important to assure full transparency of evaluations and introduce the idea of discussing them and exchanging methodologies in an organised forum. The programme of evaluation of function and capacities is one that is normally located in the ministry or ministries funding the programmes and should be independent of the agency implementing them.

4.2 International benchmarking instruments

There are three major surveys that are used to create R&D and innovation indicators. These surveys lead to a set of indicators mandatory for European member states but which are also collected internationally (on a voluntary basis) by UNESCO's Institute of Statistics. They include:

1. *R&D survey*, based on the 'Frascati Manual', which gives an overview of the research inputs and selected outputs in a country. The first R&D survey is expected to run under the current UNESCO agreement. It is, however, crucial to ensure that it will be repeated at regular intervals to produce time series that demonstrate both national trends and comparisons with Europe and the Balkan region.
2. *Innovation Survey*, based on the 'Oslo Manual', is addressed to companies only and, for European member States, has a standard questionnaire and processing software. The first Albanian survey is also planned for this year, in combination with the R&D survey. While it was implemented every fourth year in the past it is now repeated every second year in Europe and it is recommended to follow this guideline for Albania as well. In particular because Innovation Surveys have a different approach from R&D surveys it is strongly recommended to run an independent R&D survey and Innovation Survey in 2012.
3. *PhD holders' survey*, which is crucial for human resources, is new for both UNESCO and Europe and the first results are only now appearing. As this survey envisages obtaining information on human resources and migration, which is one of the major topics in the Albanian vision, it is important to foresee a similar survey in the near future. Getting data about the Albanian diaspora from OECD country surveys may also be a very useful input for the national policy.

The initial work on developing statistics funded by UNESCO needs to be pursued. This should involve the creation of the capacity and know-how in the Albanian Statistics Institute to carry out such surveys and report to international statistical bodies, allied to the development of capacity within MES to analyse and use statistical data in developing policy.

ANNEX

Action Plan for implementation of the National Strategy of Science, Technology and Innovation 2009–15

Nr.	Activity	Description	Responsible institution	Monitoring indicators	Timeframe
1. Defining National research priorities					
1	Analysis of existing capacity within public administration and development of new skills necessary to carry forward studies (foresight, technology road-mapping, technology assessment)	The objective of this activity is to assess the existing capacity within MES to initiate and administer forward studies. Based on the results emerging from that assessment, tailored technical assistance will be provided to ensure that the Department of Science of MES is well prepared to effectively and efficiently manage the process of design and implementation of such studies in the future.	MES	independent assessment report on capacity and training needs to administer forward studies that is prepared, submitted and accepted by contracting authority technical assistance and training delivered including quality assessment of provided services by the beneficiaries	Sept. 09–Sept. 10
2	Selection of sectors for which detailed studies will be conducted	The aim of this activity is to select strategic sectors, from those identified in the National Strategy for Development and Integration and during the preparation of the National Strategy of Science, Technology and Innovation (2009–2015), which will be subject to more detailed analysis. In the light of importance of bottom up approach in research priority setting, a decision about selection of sectors for in-depth reviews will be taken following the consultation process.	governmental decision / MES (leading consultation process)	consultation process is completed and analysed decision is made, taking into account the results of the consultation process, on the sectors for which detailed assessment will be prepared	Sept. 09–Sept. 10

3	Assessment of R&D potential and setting of priorities for strategic research sectors	Procurement contracts to define concrete fields of specialisation within the strategic sectors e.g. agro-food, energy or biotechnology, for which there is reason to believe that Albania has the appropriate scientific potential, as a precondition for concentrating research funding and building a specialised infrastructure.	MES (in partnership with other ministries on case-by-case basis)	detailed assessment setting out 'technology road maps' for sectors under review are prepared, submitted and approved by the contracting authority	June 10–June 11
2. Structuring STI Policy Implementation					
4	Research Infrastructure Fund	Inventory of existing research infrastructure and expert appraisal report. An expert appraisal will be carried out involving 1–3 international experts in research infrastructure strategies. This will serve as a baseline study for the programme.	MES (RTIA)	– study report setting out an estimate of the overall required investment per scientific field/institute – financing decision taken to cover programme's needs (government and identified donors)	Sept. 09–Dec. 09
		Pre-identification projects: a call for expression of interests in the form of 3–4 page preliminary applications in a structured form, launched annually from 2010. Pre-selected projects will be awarded a grant for project preparation to prepare a full proposal.	RTIA	– pre-selection of projects for full proposal phase by a committee involving at least 1–2 foreign experts plus Albanian scientific specialists – small grant to cover detailed project design awarded by MES/RTIA	Jan. 10–June 10
		Full proposals: submission of full proposals to confirm the relevance and feasibility of the research infrastructure investment project, including detailed project design, management and coordination arrangements, financing plan, monitoring and audit arrangements.	RTIA	– launch of call for proposals and management of tender procedure – full proposals will be selected by expert committee composed of at least 50% foreign experts	July 10–Oct. 10

		Project implementation and monitoring: the purpose of this stage is to procure and install the equipment/renovate the buildings and attain the expected results (utilisation rate of equipment, etc.), manage the available resources cost-efficiently and monitor and report on progress.	project coordinators, RTIA	<ul style="list-style-type: none"> – publication of procurement notice and calls for tenders by recipient research institutes/universities – specific projects up and running and well managed (interim and final progress reports) – annual report on programme implementation submitted to board of RTIA 	Nov. 10–June 12 (repeated annually until funds exhausted)
5	creation and development of Albanian Centres of Excellence in Science (ACES)	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	MES (RTIA)	<ul style="list-style-type: none"> – programme documents approved by board of RTIA – financing decision taken to cover programme's needs (government and identified donors) 	Sept. 09–Dec. 09
		Pre-identification projects: a call for expression of interests in the form of 3–4 page preliminary applications in a structured form, launched annually as from 2010. Pre-selected projects will be awarded a grant for project preparation to prepare a full proposal.	RTIA	<ul style="list-style-type: none"> – pre-selection of projects for full proposal phase by a committee involving at least 1–2 foreign experts plus Albanian scientific specialists – number of grants to cover detailed project design awarded by MES/RTIA 	Jan. 10–June 10
		Full proposals: submission of full proposals covering aspects such as centre management and legal structure, partnership arrangements, detailed description of research programme to be pursued and objectives to be met (PhDs, research results, etc.), financing plan, monitoring and audit arrangements.	RTIA	<ul style="list-style-type: none"> – launch of call for proposals and management of tender procedure – full proposals selected by expert committee composed of at least 75% foreign experts 	July 10–Oct. 10

		Project implementation and monitoring: implementation of the research projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including reporting to RTIA.	project coordinators, RTIA	<ul style="list-style-type: none"> – specific projects are up and running and well managed (annual and final progress reports) – mid-term review reports (stop-go decision on further funding) by international peer review – annual report on programme implementation submitted to board of RTIA 	Jan. 11–Dec 17 (mid-term review in spring 2013)
6	Research Eagles Grants Programme	Review of the outcomes of the current Brain Gain initiative and detailed design of new programme taking into account international good practice. Study to be commissioned with involvement of international expert(s).	MES (RTIA)	<ul style="list-style-type: none"> – programme documents approved by board of RTIA – financing decision taken to cover programme’s needs (government and identified donors) 	Sept. 09–Dec. 09
		Management of database of open vacancies for researchers related to new research infrastructure, centres of excellence or other posts in the framework of university or research centre research strategies. Award of Young and Returning Researchers grant scheme.	RTIA	<ul style="list-style-type: none"> – number of research posts opened and published – % of posts advertised filled and grants awarded 	Jan. 10–Dec. 15
		Management of annual call for scholarships for PhDs and Masters training abroad for young researchers.	RTIA	<ul style="list-style-type: none"> – number of scholarships awarded – number of Masters degrees and PhDs obtained – % of students returning to Albania after study abroad 	annual call from academic year 2010–11 onwards

		Monitoring of programme progress and preparation of annual report.	MES (RTIA)	<ul style="list-style-type: none"> – number of Masters degrees and PhDs obtained – % of students returning to Albania after study abroad – returning researchers staying in Albania after end of grant period – annual report on programme implementation submitted to board of RTIA 	2010–2015
7	National Technology Programme	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	RTIA and respective ministries	<ul style="list-style-type: none"> – approval of priority field for 2–3 national technology programmes by NCSI – programme documents approved by board of RTIA – financing decision taken to cover programme’s needs (government and identified donors) 	Jan. – July 11
		Launch of call for proposals for first national technology programme and selection of projects proposed by consortium of research institutes and enterprises (including where applicable foreign organisations).	RTIA and respective ministries	<ul style="list-style-type: none"> – number of projects selected for funding – number of projects involving business sector partners and/or foreign partners 	2012–2013
		Launch of a call for proposals for 1–2 more programmes based on the results of the first programme experience.	RTIA and respective ministries	– <i>idem</i>	2014–2015

		Project implementation and monitoring: implementation of the research projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including report to RTIA.	RTIA and respective ministries	<ul style="list-style-type: none"> – number of projects completing research activities – number of research results exploited commercially, IPR protected or used as a basis for further academic or applied research projects 	2012–2015
8	Science, technology and innovation awareness and promotion activities	Programme set up: expert advice and study of similar schemes in other countries to establish programme procedures and criteria to Albanian context. Study to be commissioned with involvement of international expert(s).	MES (RTIA)	<ul style="list-style-type: none"> – programme documents approved by board of RTIA – financing decision taken to cover programme's needs (government and identified donors) 	tbc
		Procurement or call for projects for activities to foster an interest in and an improved understanding of importance of STI for the Albanian economy and society. Call for projects to be open to media companies, NGOs, schools. Specific activities of Albanian Academy of Sciences to promote improved quality of scientific publications or promotion of Albanian research results may be foreseen.	RTIA	<ul style="list-style-type: none"> – projects selected and funded supporting promotion of STI towards young persons, business sector, etc. 	tbc
		Project implementation and monitoring: implementation of media projects, purchase of small-scale equipment or materials required for research projects, training and management activities, including report to RTIA.	RTIA	<ul style="list-style-type: none"> – number of participants to events, number of subscribers to publications, web-page traffic, etc. 	tbc
3. Strengthening policy-making capacity					

9	Establishment of the National Council for Science and Innovation	Creation of a secretariat for NCSI and adoption of government decision creating the council, including a budget allocation for running costs covering the period to 2015.	governmental decision, Office of Deputy Prime Minister	<ul style="list-style-type: none"> – Council established and operational; notably has dedicated secretariat of at least two experts and budget for fulfilling responsibilities – annual report of NCSI presented to government and parliament: ‘The State of Research and Innovation in Albania – annual progress report’ 	2010–2015
10	Delivery of a programme of training and technical assistance to Department of Science within MES	The objective of this assistance is to strengthen the capacity of Department of Science to ensure that staff are well prepared and trained to fulfil day-to-day responsibilities in terms of research policy intelligence, policy-making, linkages to other horizontal policy fields and evaluation of research policy. Support through a technical assistance programme will also cover the new staff of the secretariat of the NSCI.	MES / Office of Deputy Prime Minister	<ul style="list-style-type: none"> – technical assistance delivered and quality assessed ex-post by beneficiaries, i.e. staff of the Department of Science, NSCI Secretariat 	2010
4. Creating appropriate capacity for programme management					
11	Creation and operation of Albanian Research Agency (RTIA)	Drafting of the full business plan 2010–2015 of based on the ‘Concept Paper’, approval by government and recruitment of management committee.	Office of the Deputy Prime Minister	<ul style="list-style-type: none"> – business plan 2010–15 drafted and adopted by supervisory board 	Sept. 09–May 10
		Initial start up phase of RTIA involving recruitment and training of staff, design and launch of initial programmes. Start-up phase support by technical assistance project (to be confirmed, EU support to be requested).	RTIA	<ul style="list-style-type: none"> – RTIA established by government decision – programme funding disbursed – annual work-programmes approved by RTIA supervisory board 	June 10–Dec. 11
		RTIA fully operational. Annual process of approval of work-programme by supervisory board and of previous year’s annual report. Independent mid-term evaluation to be scheduled in 2013.	RTIA	<ul style="list-style-type: none"> – annual reports approved by RTIA supervisory board – positive mid-term evaluation (2013) 	2012–2015

5. Improving the legal and institutional framework for research policy-making and research funding					
12	Alignment of legal framework for STI with European Union <i>acquis</i> and practice	Review of existing laws concerning science, technology and innovation, including State Aid, researcher mobility, intellectual property rights, etc. The review will be carried out by a team of experts who will report to NCSI. The required revisions to existing laws or regulations or drafting of new legislative proposals will be undertaken by competent ministries or parliamentary committee, with technical assistance from expert team.	governmental decisions, Office of Deputy Prime Minister	<ul style="list-style-type: none"> – technical assistance and legislative drafts delivered on the legislative review – government decisions and/or parliamentary approval of legislative change – report on effective implementation or enforcement of new legal framework by competent ministries or other authorities (2 years after adoption of new legislative framework) 	January 2010–July. 2011
13	Improvement of institutional and management procedures of research performing organisations	Review of capacities, procedures and internal regulation influencing researchers activities (internal career and incentive systems) and management of research outputs (IPR) in universities and other research establishments. Technical assistance for development of strategic R&D plans of universities/centres and for alignment of institutional frameworks.	MES, universities and other research institutes	<ul style="list-style-type: none"> – number of research performing organisations supported by technical assistance experts – number of organisations adopting a strategic medium-term R&D plan – effective implementation of changes to institutional rules, career incentives for researchers, IPR management practices, etc. 	on-going
6. Adopting an adequate budgetary framework					
14	Mobilisation of international donors in support of STI strategy	Organisation of a donors conference dedicated to implementation of the STI Strategy.	Office of Deputy Prime Minister	<ul style="list-style-type: none"> – commitment of Albanian Government to multi-annual budgetary framework for implementation of STI strategy – funds pledged by donors as co-financing of specific elements of STI strategy 	by Dec. 09

15	Integration of Albania into, and funding received via, EU-funded Western Balkans or ERA-NET, etc. type initiatives	Participation of experts from Albanian authorities and agencies in EU-funded networks with a view to securing additional funds for development of STI policy, joint research infrastructure developments, improvement in STI statistics, etc.	MES, RTIA	<ul style="list-style-type: none"> – number of participations to networks or projects co-funded by European Commission related to European Research Area and specifically Western Balkans – funds secured for Albanian organisations/experts participating in such projects 	2010–2015
7. Installing Monitoring and Evaluation Procedures and mechanisms					
16	establishment of baseline of research performance of public research entities	The objective is to set out the baseline for evaluation of research performance within public research institutions including Higher Education Institutions, towards which progress should be measured.	MES (RTIA)	<ul style="list-style-type: none"> – special survey is disseminated among public research entities, responses collected and analysed 	Sept. 09–June 10
17	development and implementation of proposed methodology for monitoring and evaluation; technical assistance contract	Technical assistance is required to build the capacity and capability in MES for preparation and monitoring and evaluation of implementation of the national strategy for STI. Albanian Government needs to commit required resources to ensure that Division for Science in the Ministry has full complement of staff.	MES	<ul style="list-style-type: none"> – monitoring and evaluation methodology developed, presented and accepted – workshop, objective of which is to consult relevant stakeholders on proposed methodology for conducting monitoring and evaluation, is organised and quality assessed by participants 	Sept. 09–Dec. 10
18	improvement of STI statistics	Based on results of the initial UNESCO-supported pilot surveys in 2009, the Albanian Statistical office, MES and other concerned ministries will continue to develop the minimum baseline statistics allowing integration of Albania in the main European and international statistical databases for STI. Further support from UNESCO or EU funded projects will be required to implement this activity.	MES, Albanian Statistical Office	<ul style="list-style-type: none"> – production and publication of principal STI statistics to standards allowing their inclusion into the main international and European statistical databases 	2010–2015