

EU 6th Framework Programme
Instrument: Co-ordination Action

Building and Improving Support for RTD Policy and Public Spending (BIS-RTD)

External Audits

Region of Valencia, Spain

Olomouc Region/Czech Republic

Region of West Pannon, Hungary

Serbia

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1 Introduction

Innovation is a cornerstone of the “Lisbon strategy” launched by the European Council in March 2000, and emphasized by subsequent European Councils, in particular at Barcelona in 2002. While innovation policies take place mostly at the national and regional levels, the Member States and the Commission shall intensify their co-operation for the strengthening of innovation in the EU, including co-ordination and assessment mechanisms for mutual learning, as well as for taking stock of progress achieved.

BIS-RTD aims at building a methodological framework and a learning platform for regional and national RTD policy makers and stakeholders interested in obtaining support arguments for their requests to bring public research funding to the Barcelona target level. The following European Regions participate in this endeavor:

- Region of Valencia, Spain
- Region of Stockholm, Sweden
- Olomouc Region, Czech Republic
- Region of West Pannon, Hungary
- Slovenia
- Scotland, United Kingdom
- Serbia
- Turkey

As a final work package, external audits to the partner countries shall assess the outputs of the previous work packages and give additional recommendations with regard to RTD objectives, strategies and instruments.

Dr. Barbara Haering¹ (Switzerland) was asked to do the external audit for the regions of Valencia (Spain), for the Czech Republic, West Pannon (Hungary) and Serbia. The site visits took place in January and February 2008. The assessments presented in this report also take into consideration the preliminary findings and reports prepared by the project partners of BIS-RTD.

¹ CV in Annex 1

2 Region of Valencia, Spain

2.1 Site Visit to Valencia

The assessment is based on a site visit to Valencia that took place on January 7 and 8, 2008. During this visit the following institutions and representatives were visited and interviewed:

INSTITUTIONS	REPRESENTATIVES
FUNDATION COMUNIDAD VALENCIANA – REGION EUROPEA	Marcos Ortiz-Vandenplas SMEs and Innovation, BIS-RTD, WP2 co-ordinator (organizer of the visit)
RED DES INSTITUTOS TECNOLOGICOS DE LA COMUNIDAD VALENCIANA (REDIT)	Julia Climent Monzo Directora, Coordinacion y Gestion Ignacio Miranda Barcelo, Responsable Area Técnica
UNIVERSIDAD POLITECNICA DE VALENCIA CENTRO DE APOYO A LA INNOVACION, LA INVESTIGATION Y LA TRANSFERENCIA DE TECNOLOGIA (CTT)	Fernando Cones Cegarra Director adjunto
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS UNIVERSIDAD POLITECNICA DE VALENCIA INSTITUTO DE GESTION DE LA INNOVACION Y DEL CONOCIMIENTO-INGENIO	Dr. Ignacio Fernandes de Lucio Director
MUSEO DE LAS CIENCIAS PRINCIPE FELIPE – L’HEMISFERIC	Manuel Toharia Cortes Director
IEP	Luis Ballester Management of BIS-RTD

2.2 Economic Development of Valencia Region

The economic development of the region of Valencia tells at least four stories:

- **Traditional background:** The first story is the history of a traditional economy based on an export-oriented agricultural sector² and on traditional industries³. The industrial sector represents 20.9% of the regional GDP. The fact that more than 90% of all companies of the region belong to SME still reflects this traditional economic background.
- **Tourism:** The second story is the story of tourism. In the Valencia region tourism started with summer vacations on the shore – and with elderly people from northern parts of Europe⁴ settling in the region after their retirement. However, tourism is now diversifying with regard to seasons, areas and leisure opportunities. The emblematic constructions of Calatrava for art and science have strongly contributed to this development. Today tourism contributes with 12% (2005) to the regions GDP – and is still increasing.
- **Trade:** The port of Valencia has become one of the most important ports in the Mediterranean. This situates the region of Valencia in second place in exporting activities and in third place with regard to imports among Spain's 17 autonomous regions.
- **Innovation:** The last story is about innovation: In a relatively short period, the regions economy has changed. Today the service sector represents 65.4% (2005) of the regional GDP. The important public investments in emblematic constructions for art and science add visibility to this development.

Based on the interviews of this site visit it becomes clear that the changes of the economic structure of the region of Valencia have yet not come to an end. Low tech-industries of the region and particularly low-tech SMEs may soon not be able to compete on global markets anymore. Therefore, R&D efforts are crucial for the future economic development and growth of the region.

2 Citrus production being the main sector.

3 The ceramic cluster is the most important industrial sector of the region.

4 Mainly from Germany.

2.3 R&D and Technology Transfer Strategies

Based on the site visit to Valencia R&D and technology transfer strategies of the region of Valencia can be assessed as follows:

- **National R&D strategies:** Spain's R&D strategy is part of the overall Spanish National Reform Program (NRP). Its research investment objective is ambitious: 2% of GDP by the year 2010. This will be an important step towards achieving the "Barcelona objectives". This strategy can be successful if an annual increase of 25% is guaranteed – including financial participation of regional authorities as well as private expenditures. However, the capacities not only to invest, but also to absorb R&D investments vary from region to region according to the economic structure of a region. This has to be taken into account.
- **Regional R&D investments:** In 2003 the region of Valencia obtained 166.4 Million € coming from the Spanish National Plan for R&D. This is 13% more than 2002 and 8.5% of the national budget. Taking into account the specific economic structure of the region, with its particularly high percentage of SME and it's still rather traditional industrial sector, we come to the conclusion that the R&D investment absorption capacity of the region of Valencia is below average. In other words: The way R&D investments are invested and managed might be more decisive than the overall amount of R&D investments.
- **Regional R&D strategy:** There is no explicit R&D strategy or technology transfer strategy for the region of Valencia, defining regional objectives, strategies and measures to achieve explicit regional objectives. Nevertheless, the site visit showed, that the regional actors⁵ work in close co-operation and with a common understanding with regard to regional needs.
- **REDIT:** In April 2001, the Valencia Government launched a network of technology institutes of the region. REDIT works as a self-governing and non-profit association offering specific services to participating research institutes and industrial partners and enhancing synergies in the field of research, development and innovation. REDIT has soon become the most important driver of regional R&D and technology transfer efforts. REDIT was also successful in establishing contracts with interesting media partners, thus contributing to a better visibility of R&D in the public. It is the explicit goal of REDIT to increase the participation of SMEs in the network and thus to facilitate their contacts with scientific institutes and universities. Eight of the research insti-

⁵ Universities, industrial partners, authorities.

tutes of REDIT are located in the Parque Tecnológico of Valencia. This neighborhood facilitates contacts and co-operation on a daily basis.

- **Technology transfer strategy of UPV:** In 2007 the Universidad Polytechnica di Valencia (UPV) has established for the first time an explicit Technology Transfer Strategy. Technology transfer is perceived as being part of a comprehensive R&D strategy. Moreover, UPV is building up a network/club of industrial partners in order to institutionalize the contacts of the university and its researchers with potential industrial partners. Based on the site visit we strongly support these initiatives and their comprehensive approach. Regular contacts between R&D partners can enhance mutual understanding of specific needs. This strategy seems also promising in view of strengthen confidence between the University and the economic sector.

To sum up: There are important R&D as well as technology transfer efforts in the Valencia region. However, an overall regional R&D strategy is missing. A regional R&D strategy, elaborated jointly by the authorities, the economic sector as well as the universities and research institutes could set up a comprehensive framework for R&D as well as for technology transfer in the region and thus could contribute to a better understanding of needs and opportunities of the partners.

2.4 R&D Communication

Communication on R&D as well as on technology transfer is not an easy task. Science as such is complex and technology transfer processes as well. Moreover, researchers rarely have the ability to communicate with a broader public. However, building up a regional "culture of science" can be decisive in view of a sustainable R&D funding and in order to enhance co-operation of universities with industrial partners. Based on the site visit in Valencia the assessment of the R&D communication efforts in the region can be summarized as follows:

- **Sustainable networking:** Building up a sustainable network of research institutions and industrial partners is one of the most important aspects of a successful R&D communication strategy. REDIT therefore plays a central role in this regard. The network itself is the most important instrument of communication.
- **Websites and media:** Institutions and persons directly involved in R&D as well as in technology transfer will find the information they need on the inter-

net. Therefore, all institutions concerned have established specific websites. However, regular publications in public media⁶ are important as well in order to build up a "culture of science". The fact that REDIT was able to create sustainable partnerships with the media through specific agreements with a number of newspapers seems particularly interesting and promising. The agreements assure a regular co-operation.

- **Emblematic institutions:** The experience of Valencia shows how emblematic institutions and buildings as the Museo de las ciencias Principe Felipe – L'HEMISFERIC have the potential to increase the visibility and the importance of science in a region and thus, not only fosters tourism, but has an impact on the public attitude towards R&D, since people get the chance to experience themselves what research and science can offer in view of a sustainable future.

To sum up: The visit to Valencia underlined the fact that it needs constant and long term efforts on various levels to build up a culture of science as a solid foundation for sustainable R&D and technology transfer activities and funding.

⁶ Local, regional and national print media, radio stations, TV.

3 Olomouc Region/Czech Republic

3.1 Site Visit to Prague

The assessment is based on a site visit to Prague that took place on January 21 and 22, 2008. During this visit the following institutions and representatives were visited and interviewed:

INSTITUTIONS	REPRESENTATIVES
TEACHING HOSPITAL PRAGUE	Prof. Dr. Pavel Klener Head of the Internal Clinic and former director of the Institute of Hematology; former Minister of Health, former parliamentarian, former member of the R&D Council and former Prorector of the Charles University in Prague for science and research.
ACADEMY OF SCIENCE OF THE CZECH REPUBLIC	Prof. Dr. Vaclav Paces President of the Academy of Science
MINISTRY OF EDUCATION, YOUTH AND SPORTS	Petr Mateju Director of the Analytically-Conceptual Bureau of the Ministry of Education, member of the Academy of Science
REGIONAL AUTHORITY OF THE OLOMOUC REGION	Daniela Korena Organizer of the site visit

The visit did not include a journey to the Olomouc Region, since the decisive actors could be interviewed in Prague.

3.2 Economic Development of Olomouc Region

The region of Olomouc has a mainly industrial character, the highest employment rates being in the industrial and construction sector. The service sector is developing for business and for personal services. The region continues to attract foreign investors. The educational centre of the region is Palacky University, the second oldest university of the Czech Republic. Since three years the private Moravian College Olomouc offers education in the economic managerial branch.

Since the site visit took place in Prague, no additional information can be given with regard to the economic development of the region.

3.3 R&D and Technology Transfer Strategies

Based on the site visit to Prague R&D and technology transfer strategies of the Czech Republic can be assessed as follows:

- **Reform process:** The R&D funding system in the Czech Republic is right now going through a process of major reform. The objective of this reform is to strengthen R&D as well as technology transfer in the Czech Republic. The reform prepared by the Research and Development Council shall be submitted to the Government in February and to the National Parliament in May 2008. Since also the opposition supports these efforts the new legislation could pass in summer 2009 and be implemented in 2010. The reform touches the main aspects of R&D and technology transfer in the Czech Republic. They will be summarized in the next paragraphs.
- **Transparency, harmonization and competition:** Transparency and harmonization with regard to funding criteria shall be achieved by reducing the budgetary chapters for R&D funding from more than twenty to less than ten. The overall objective of this strategy is to increase the competition in R&D funding and thus to foster effective R&D investments as well as scientific excellence. These changes will particularly affect the funding of research institutions.
- **Improving evaluation methodology:** Hand in hand with the enhanced competition in R&D funding the methodology of R&D evaluation will have to be further developed. R&D evaluation criteria will have to be improved in order to allow a thorough and transparent evaluation of institutions and projects in the framework of a competitive funding system.
- **Clear competences:** Although the Research and Development Council is chaired by the Prime Minister and thus is somehow ranking even above the different ministries, this body has only consultative powers. The ongoing reform aims at strengthening the formal powers of this council in order to clarify the competences of the actors involved in R&D politics.
- **Technology transfer:** The reform shall include the establishment of a specific grant agency funding research in the field of technology. One precondition for receiving grants shall be a 50% participation of private R&D investment in a project. It will be an important task of the agency to foster networks between research institutes, universities and industrial partners.
- **Private investments:** To increase private investments in public/private R&D projects the tax law will have to be amended as well since the existing tax law

gives particular incentives to “in-house” research of companies instead of fostering co-operations with public research institutions and universities.

- **University management:** At the same time the system of higher education shall be reformed as well. One of the major objectives of this reform being the improvement of the management capacities within the universities. Professional management capacities in universities and in research institutes are essential in order to guarantee an effective allocation of public and private R&D funds.
- **Barcelona objectives:** Based on the site visit, we come to the conclusion that the Barcelona objectives will not be achieved in the next years. However, we believe, the ongoing reform is an important step in order to build up an R&D system that effectively can make use of gradually increasing public and private funds. Moreover, the reform program specifically aims at increasing private investments into R&D.

To sum up: The system of R&D funding of the Czech Republic is undergoing an important reform process right now. Hopefully, this process will strengthen R&D capacities as a precondition for successful R&D funding. As an impact of this development the innovative capacities of the economy in the Czech Republic should be strengthened as well.

3.4 R&D Communication

A supportive public opinion toward research and to scientific innovation – also with regard to genetic engineering, stem cell research and nuclear power – in has a long tradition in the Czech Republic. This public support for R&D is an important precondition for a sustainable R&D funding by public authorities.

Up to now no specific R&D communication strategy seems to have been developed. Nevertheless, some newspapers⁷ as well as the National TV station provide regular R&D information.

⁷ Specially the leading economic newspaper of the Czech Republic.

4 Region of West Pannon, Hungary

4.1 Site Visit to Győr

The assessment is based on a site visit to West Pannon/Győr that took place on January 24, 2008. During this visit the following institutions and representatives were visited and interviewed:

INSTITUTIONS	REPRESENTATIVES
REGIONAL UNIVERSITY KNOWLEDGE CENTRE FOR VEHICLE INDUSTRY	Tamas Szilasi Managing Director
INNOT – INNOVATION AND TECHNOLOGY CENTRE	Laszlo Budavari Managing Director INNOT, representative of the Hungarian Association of Innovation
WEST-PANNON REGIONAL DEVELOPMENT AGENCY	Marta Gal Innovation expert
HUNGARIAN ACADEMY OF SCIENCES – CENTRE OF REGIONAL STUDIES	Dr- Andras Grosz Economist, research fellow, member of the regional Innovation Agency
CHAMBER OF COMMERCE AND INDUSTRY	Mika Norbetné Horvath Timea Leader of international relations department project, manager of Hungary for FP6
WEST PANNON REGIONAL DEVELOPMENT AGENCY	Eszter Fatrai Project Manager, organizer of the site visit
Some of the interviews were facilitated by Ms Helga Parkai as interpreter.	

4.2 Economic Development of West Pannon

West Pannon is one of the economically most dynamic regions of Hungary. Only the Central Region of Hungary is stronger than West Pannon with regard to growth in exports, GDP per capita and FDI inflow. Machine industry, textile industry and food industry⁸ are the most important regional industries.⁹ The economy of the region shows a dual structure:

- **Export-oriented:** There is a relatively narrow group of export-oriented and foreign-owned large companies. These companies invested in the region between 1991 and 1994. They were followed by smaller but also export oriented and foreign-owned companies in the late 90ies. Some of them – especially from the textile industry – have already left the region again, because of rising in labor costs. Others try to upgrade their activities by fostering R&D.
- **Regional economy:** On the other hand there are a large number of mostly Hungarian owned small and medium-sized enterprises (SME). The rate of SME is 94%.

Bearing this economic structure in mind as well as the ongoing process of economic globalization, it becomes clear, that West Pannon faces the challenge of developing a knowledge based economy while particularly strengthening its SME. R&D as well as technology transfer will be essential in this endeavor.

4.3 R&D and Technology Transfer Strategies

Based on the site visit to Győr and on the preliminary report prepared by the BIS-RTD- team of West Pannon the following assessment can be presented:

- **National and regional R&D strategies:** Already in the 1990ies Hungary developed national and regional R&D strategies. These strategies have periodically been modified – sometimes also following political changes on the national level. In 2004 the new Innovation Law set the legal framework for an Innovation and Research Fund matching public and private funds¹⁰ – 25% of the money being reserved for projects on the regional level. Regional development agencies are active in implementing the regional R&D strategies.

⁸ 70% of the employments are in these sectors.

⁹ With regard to the shares in total employment.

¹⁰ 50% public, 50% private funds.

However, the experts criticized the fact, that strategic priorities seem to have been modified too often during the last fifteen years. The necessity for long term stability in R&D strategies has indeed to be stressed. Building up successful and sustainable R&D capacities as well as technology transfer projects is not about short term objectives but about mid- to long term perspectives. “Stop and go” policies cause important problems for research and development – and for successful technology transfer strategies as well.

- **Implementation on the regional level:** Hungary has strong political structures on the national and on the local level. However, there are no authorities with regional revenues on the regional level. This seems to hamper the implementation of regional R&D strategies, since the regional development agencies lack political counterparts fostering a regional agenda. Moreover, the regions have been defined on the basis of statistical analysis rather than on economic and social structures, developments and identities.
- **Support of innovation:** Some 40 institutions are fostering innovation, R&D and technology transfer in the West Pannon region. Most experts complained about duplications of activities and unclear responsibilities. The large amount of institutions seems to hamper an effective and efficient implementation of R&D strategies in the region. The variety of institutions is due to changes in R&D strategies on the national level as well as to the lack of regional authorities able to harmonize R&D efforts on the regional level. Nevertheless, there are encouraging examples to mentioned: In order to cope with the growing demand, the Innovation and Technology Centre INNOT is planning an important extension of its facilities and activities, including new services – particularly a rapid prototyping lab, able to contribute to bridging the gap between innovation and market.
- **Innovation gap:** Although the West Pannon region has an important GDP, its R&D activities are below average compared to other regions of Hungary. This innovation gap has several reasons. The large export-oriented and foreign-owned companies mainly rely on R&D carried out in their home country. It's only lately that these companies start to increase R&D also in the region. Moreover, the Regional Development Agency as well as the Chamber of Commerce and Industry of Győr mentioned, how difficult it is, to make SME interested in (mid or long term) R&D since usually they are busy with short term problems.
- **Barcelona objectives:** Based on the site visit, we come to the conclusion that the Barcelona objectives will not be achieved in the next years. The objectives of the Hungarian government is to reach 2.1% of GDP by 2013. The experts in West Pannon regional stressed the problem of a missing R&D de-

mand – particularly by SME. Therefore, specific efforts shall be undertaken in the next years to make SME aware of the challenges they will have to cope with in their future economic development – and how R&D could contribute to their sustainable growth.

To sum up: A variety of institutions are committed to implement R&D efforts and technology transfer strategies in the West Pannon Region. Encouraging can be mentioned. However, the lack of regional authorities hampers their coordination and success. Taking the above mentioned innovation gap into consideration, this is a major concern.

4.4 R&D Communication

As a part of the overall marketing strategy, the West Pannon Regional Development Agency has also developed a specific communication strategy. The objective of this communication strategy is twofold:

- **“Internal” communication:** Improving the communication among the R&D and technology transfer actors in the region. Since there are a lot of different innovation initiatives active in the region, the improved communication should also foster a better co-ordination of their activities.
- **External communication:** Increasing the public communication with regard to R&D, innovation and technology transfer. This objective shall be reached by an intensified cooperation with local newspapers, TV and radio stations.

The implementation of this strategy seems decisive in order to sustain the variety of R&D as well as technology transfer initiatives in the region.

5 Serbia

5.1 Site Visit to Belgrade

The assessment is based on a site visit to Serbia that took place on February 20 and 21, 2008. During this visit the following institutions and representatives were visited and interviewed:

INSTITUTIONS	REPRESENTATIVES
UNIVERSITY OF BELGRADE	Prof. Dr. Aleksandar Semak Vice-Rector for International Relations
BUSINESS TECHNOLOGY INCUBATOR OF TECHNICAL FACULTIES, UNIVERSITY OF BELGRADE	Gordana Danilovic Grkovic General Manager
ECPD, EUROPEAN CENTER FOR PEACE AND DEVELOPMENT	Prof. Dr. Ljubisa S. Adamovic Special Councilor Prof. Vlastimir Mategic Special Councilor Bojan Starec General Coordinator International Relations & Cooperation Masan Gosovic ECPD associate

The site visit took place three days after the declaration of independence by Kosovo. Therefore, the responsible persons in the Science Ministry were unfortunately forced to cancel the appointments planned for this site visit.

5.2 Economic Development of Serbia

Serbia is facing multiple transition processes: From chaos and war to peace, stability and democracy, from being a large federal republic to being a small state and from an economic system “sui generis” towards market economy. These transition processes are a major challenge for society, for politics, for the economic development and for the R&D-system of Serbia as well. The dissolution of the former Federal Republic of Yugoslavia and the war of the 1990ies destroyed the industrial R&D tissue of the country and led to a brain drain that has not yet come to an end. New foreign investments usually rely on R&D carried out abroad. Therefore, even new foreign investments in Serbia do not create a domestic demand for R&D.

5.3 R&D and Technology Transfer Strategies

Given the specific transition period Serbia is going through, this assessment concentrates on challenges Serbia’s R&D system is facing. However, there are also achievements to be mentioned. The following SWOT-analysis¹¹ is based on the discussions with the experts of the Serbian R&D system in Belgrade.

Strengths. In spite of the major problems Serbia’s R&D system is facing, specific strengths can be mentioned as well:

- **Old traditions of science and education:** Serbia has an old tradition of high standard formal education. Science and research has always been highly appreciated and the University of Belgrade was and still is the largest university on the Balkan.

Weaknesses. The weak points of Serbia’s R&D system can be summarized as follows:

- **Lack of R&D demand:** The lack of R&D demand is the main problem of Serbia’s R&D system. The lack of domestic R&D demand is also the reason why the brain drain that started during the conflict of dissolution of the former Federal Republic of Yugoslavia did not yet come to an end.
- **No private investments in R&D:** Moreover, there are practically no private investments in R&D in Serbia today. Therefore, neither university institutes

¹¹ SWOT-Analysis = Analysis of **S**trengths, **W**eaknesses, **O**ptions and **T**hreats.

nor the so called independent research institutes (RDI) can find industrial partners for joint R&D projects.

- **Lack of funding:** Whereas public funding of R&D had been over average in the Federal Republic of Yugoslavia, Serbia has not yet reached the former level of public R&D spending again. In 2003 the government decided to gradually increase R&D funding in order to reach 1.4% of GDP in 2010. However, starting with 0.1% of GDP in 2001 the budget of the Science Ministry has only reached 0.38 of GDP in 2007. Adding the approximately 0.3% of GDP invested in new equipments for research by the National Investment Plan, Serbia's public R&D spending today reach about 0.7% of GDP.
- **Lack of coordination:** The experts criticized the lack of coordinative actions of the ministries concerned with R&D. An intensified cooperation and coordination would particularly be needed with regard to the Ministries of Science and of Economy. But also other ministries as for example the Ministries for Energy, Agriculture, Health and Defense should join in this endeavor. Such coordination should help identifying national needs for R&D and foster an effective and efficient allocation of R&D funding.
- **Traditional teaching:** Higher education as well as university teaching in Serbia still follows traditional teaching methods, focusing on knowledge transfer rather than teaching the students how to learn and how to do research themselves. Since universities and RDI have been separate worlds up to know university teaching is not research based and students have practically no opportunities to be involved in research projects. Teaching of research know how therefore is weak. Moreover, there is no training of soft skills like business management in technical curricula.

Opportunities. Based on the site visit to Belgrade the following opportunities can be reported:

- **Individual initiatives:** During the 1990ies the scientific community learned how to survive under very difficult conditions. This has led to a community of committed researchers, striving to do their best also under difficult circumstances .
- **International integration:** The integration of Serbia in European R&D initiatives is absolutely crucial for a fruitful future of Serbia's R&D system. Being integrated in international R&D initiatives has the potential of creating a foreign R&D demand – and thus to foster R&D in Serbia.

- **Low labor cost:** For the years to come Serbia will still have low labor costs, even in R&D. This could be a window of opportunity to get involved in international R&D co-operations.
- **Bologna Reform:** The so called Bologna Reform of university curricula may contribute to modernizing university teaching in Serbia. Moreover, being involved in the EU-Erasmus program will offer students new teaching experiences abroad. On the long run this will also influence university teaching in Serbia.
- **Institution building program:** Although the implementation of the program of institution building has only started lately, some interesting examples can be mentioned already. The visit to the Business Technology Incubator of the technical faculties of the University of Belgrade showed how a small but committed team can build up an institution and have an impact also on university teaching. The incubator is offering specific training in business management, supporting spin offs¹² by providing specific management services¹³ and fosters innovation driven technology transfer. Next year their business management trainings will be offered as part of the normal curricula in the technical faculties.

Threats. One major threat has been mentioned during this site visit: It's the threat of a political backlash as a consequence of the declaration of independence of Kosovo. Hopefully, this will not take place and Serbia will continue its way towards a successful European integration.

To sum up: Integrating Serbia's R&D system in European R&D strategies and programs seems to be the most promising strategy to build up R&D demand in Serbia.

5.4 R&D Communication

Up to now Serbia has not particular strategy in R&D communication. However, there are good practices to be mentioned, as for example the competition for the best technological innovation. Broadcasting the award ceremony adds important visibility to innovation and R&D in Serbia.

¹² The Incubator started with 6 spin offs and plans to host up to 18 spin offs.

¹³ In the fields of accounting, legal questions and tax systems.

6 Best Practice

Based on the site visits and taking into account the preliminary reports of BIS-RTD important lessons were learnt and the following recommendations can be formulated. They should be addressed to universities, the economic sector, to the regional and national authorities as well as to the European Union.¹⁴

6.1 Technology Transfer

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>Technology transfer has to be part of an overall R&D management strategy.</p> <p>In order to be successful, technology transfer has to be part of a comprehensive R&D management. In other words: Already the design of a research project has to take into account the objective of transferring results into the world of application at the end of the project. Having the industrial partners on board from the beginning facilitates the transfer of innovation.</p>				
<p>Technology transfer as a give and take.</p> <p>Technology transfer is not just a one way track and does not only mean bringing knowledge and innovation from universities or research institutes to industrial partners – but also to bring knowledge generated by the industrial partners into the university system. Best practices to achieve this give and take are:</p> <ul style="list-style-type: none"> - Internships of students in the industry - Joint projects of research institutes and industrial partners - Industrial partners lecturing at the universities - Sabbaticals of university professors in the industry 				

¹⁴ **U** = Universities; **E** = Economic sector and particularly the industrial partners of universities
A = Regional and national authorities ; **EU** = European Union

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>Technology transfer has to demand driven as well as innovation driven.</p> <p>Demand driven R&D usually leads to improving existing technologies or processes. In order to bring real innovation to the economic sector, technology transfer should not only be demand driven. The innovation driven part of technology transfer has to be enhanced. Therefore, research institutes should strengthen their “proof of concept” instruments.¹⁵</p>				
<p>Seed capital is important for a successful innovation driven technology transfer.</p> <p>Public money will be needed for the innovation driven part of technology transfer, since venture capital is lacking. However, industrial partners should also contribute financially. Matching funds seems to be the most successful strategy to foster innovation driven technology transfer.</p>				
<p>Universities and research institutes should develop explicit R&D and technology transfer strategies</p> <p>In order to achieve tangible objectives it is important that universities and research institutes develop explicit strategies for their R&D as well as for their technology transfer efforts.</p>				
<p>Regional R&D and technology transfer strategies are needed.</p> <p>Since every region and every economic sector is facing particular challenges and opportunities technology transfer strategies should have a regional perspective and should take into account the specific needs and potential industrial partners.</p> <p>Successful R&D and technology transfer strategies therefore have to be developed as a joint effort of the economic sector, the authorities and the universities, thus strengthening strategic reflections of all partners.</p>				

¹⁵ Rapid prototyping labs for example.

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>Institutionalized contacts are crucial. In order to build up the confidence needed for a successful and sustainable co-operation, regular contacts between universities and their potential industrial partners in the region should be institutionalized.</p> <p>Regular contacts help learning the language and the rational of partners. Building up specific clubs of regional companies as “group of friends of the university” seems to be a promising strategy. Members of such a “group of friends” may receive first hand information as a club-service.</p>				
<p>Building up networks is key to a successful technology transfer. Building up networks and clusters of industrial and research partners is a promising way of fostering cooperation, joint projects and thus technology transfer. Such networks are particularly important for SME, since it is rather difficult for them to get in contact with universities.</p> <p>However, the restriction of the EU-Framework Programmes with regard to the possible number of project partners from one region (only two partners from one region can participate) somehow undermines the effort to build up such clusters.</p>				
<p>Special care has to be given to addressing SME. SME usually don't have the (human) resources to tackle more than their daily business. Therefore, R&D institutions have to address them specifically in order to make them interested in R&D and in technology transfer.</p> <p>A first step to successfully integrate SME in R&D networks is to get to know their specific needs and to offer them concrete services. Thus, mutual understanding and trust can develop.</p>				

6.2 R&D Policies

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>It's not only the funding of R&D that is important. Not only the investment capacity, but also the capacity to absorb R&D investments varies from region to region according to the economic structure of a region. Therefore, strategies of R&D funding have to take regional specificities into account.</p>				
<p>Competitive funding is important. In order to achieve scientific excellence funding of universities and research institutions as well as of research projects should be competitive. Therefore, harmonized quality criteria have to be developed to allow a transparent evaluation of institutions and research projects.</p>				
<p>International integration and cooperation is decisive. Being integrated in international R&D initiatives and cooperating with foreign R&D partners – particularly in the framework of the European Framework Programmes – can be a major opportunity for countries with weak R&D systems. Being integrated in these initiatives can create foreign R&D demand where domestic R&D demand is lacking.</p>				

6.3 University Policies

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>Being internationally competitive is decisive. Research and development are competing at an international level. The University system of a state has to be able to participate in this global competition. This may mean restructuring the national university system with regard to national needs and possibilities and reducing quantity to achieve quality.</p> <p>Moreover, universities and research institutes have to have management capacities to successfully allocate R&D funds.</p>				
<p>University teaching is key. The graduates are the most important output of universities. They are the most important contribution of universities to technology transfer.</p> <p>Moreover, start ups by university graduates are much more important for the economic tissue of a region than spin offs of a university. Therefore, university teaching is key for the economic success of a country and its regions.</p>				
<p>Fostering entrepreneurship has to be part of standard curricula. Fostering the sense of entrepreneurship as well as teaching specific business management knowledge as a part of basic university teaching will contribute to a successful technology transfer.</p> <p>Including internships in the industry as a part of study requirements can play an important role in this.</p>				

6.4 R&D Communication

LESSONS LEARNT – RECOMMENDATIONS	Addressed to			
	U	E	A	EU
<p>Proactive R&D communication strategies are needed. Institutions and persons directly involved in R&D as well as in technology transfer will find the information they need on specific websites. However, regular publications in the media are important in order to build up a "culture of science".</p> <p>Therefore, the strategy of building up sustainable partnerships through specific agreements of institutions and networks with the media seems particularly interesting and promising. In any case proactive information strategies have to be developed by the universities, research institutes as well as authorities concerned.</p>				
<p>Translation is needed. Bridging the gap between science and a broader public is a demanding challenge. Researchers usually are not interested in the vulgarization of their work and results. Therefore, professional "interpreters" are needed at the interface.</p>				
<p>Making the broad public interested in R&D is crucial for a sustainable public R&D funding. Attractive offers like science and technology museums or organizing public events in research institutes are key to building up a culture of science within society.</p>				

6.5 Additional R&D Related Policies

LESSONS LEARNT – RECOMMENDATIONS				
	U	E	A	EU
<p>It's all about the right policy mix! In order to be successful with regard to R&D and technology transfer a close coordination of science politics, economic and regional development, tax and immigration policies. This also means an in depth cooperation of the ministries and authorities concerned.</p>				
<p>Fostering regional R&D means fostering regional development in general. Fostering regional R&D and technology transfer will not be successful if it does not go hand in hand with fostering regional development in general. Regional authorities with regional revenues are crucial as political counterparts and drivers of regional R&D and technology transfer initiatives.</p>				
<p>Tax policies are important. A sustainable R&D policy needs a predictable tax system. Tax laws should give incentives for private investments in public co-funded R&D. This could foster public/private partnership R&D projects.</p>				
<p>Immigration policies are important as well. Immigration laws have to take into account the specific needs of universities and research institutes. They should facilitate international cooperation of researchers.</p>				

A-1 Annex 1: CV Barbara Haering

Studies	
Studies in Environmental Sciences Federal Institute of Technology in Zurich, <i>Dipl. Natw. ETH</i>	1972 – 1977
Post-graduate studies in Physical Planning Federal Institute of technology in Zurich, <i>Raumplanerin ETH/NDS</i>	1977 – 1979
Doctorate in Physical Planning and Political Sciences Federal Institute of Technology in Zurich, <i>Dr. sc. nat.</i>	1993 – 1996
Professional Career	
Research, consulting and project management as independent researcher and for INFRAS AG, Zurich	1980 – 1993
Secretary General of the Socialist Party of Switzerland	1997 – 1998
Director of e c o n c e p t AG, Zurich, www.econcept.ch Research, Consulting, Project Management	Since 1998
Expert	
Investigation of the Strategic Intelligence Services Federal Department for Defense, Civil Protection, Sport (CH)	1999 – 2000
Commission on Environmental Research Federal Department for the Environment (CH)	since 2001
International Peer Review ENAC, Federal Institute of technology, Lausanne	2006
Political Career	
Local Planning Committee, City of Adliswil	1977 – 1980
Cantonal Parliament, Canton of Zurich	1979 – 1983
National Council	1990 – 2007
Committee on Science, Education and Culture of the NC Chair	1990 – 1998 1994/95
Defense Committee of the NC Chair	1990 – 2007 2006/07
Parliamentary Assembly of the OSCE Rapporteur for Economy, Environment and Science Vice-President	1995 – 2007 1999 – 2002 2002 – 2007
Boards	
Board of the National Science Foundation	Since 1995
Board of the University of Zurich	1998 – 2007
Chairing the Board of the Institute of Advanced Studies in Public Administration (IDHEAP), Lausanne	Since 2005
Board of the Federal Institutes of Technology of Switzerland	Since 2008
European Research Area Board (ERAB)	Since 2008