

## STRATEGY AND ACTION PLAN

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# THE TECHNOLOGY TRANSFER SITUATION IN CENTRAL EUROPE

The activities within the CERIM project allowed for a comprehensive analysis of the technology transfer situation in Central European countries. Accordingly, the strengths, weaknesses, opportunities and threats within the area of technology transfer were identified by each project partner (SWOT-analysis). Even though the regions have a partly different situation regarding technology transfer, they have also aspects in common. The most important results from the SWOT-analysis are presented below as an aggregation for the region of Central Europe.

## Strengths

The region of Central Europe is characterised by the following strong areas when it comes to technology transfer:

### ***Strong internal knowledge base***

Overall, most regions in Central Europe are characterised by a strong knowledge regarding knowledge transfer. Technology transfer institutions (TTIs) in these regions employ experienced consultants that have build up a good know-how about how to evaluate research results and how to cope with IP management rights and procedures, not at least through the CERIM project. Some of the consultants have further extensive knowledge in certain business fields, such as clean technologies, automotive, human resources. In order to remain this strong internal knowledge base, TTIs offer non-financial incentives for their employees.

### ***Experience in project management***

A majority of the project partner is actively participating in national and international research programmes, e.g. the Framework Programmes. By managing technology transfer projects on a national and international basis, TTIs reply to the universities' and companies' objective to cooperate internationally in order commercialise research results on a broader scale. The participation in different projects allows in addition developing the TTIs methodology for project selection based on both international tools and domestic knowledge. Moreover, the project references help prove for potential customers that the TTI's staff have the necessary skills. Many TTIs in Central Europe are further actively participating in contract research for industrial partners.

### ***Strong local networks***

The existing networks of TTIs in Central Europe are described to be strong on a local and regional level. In particular with professionals, universities and other research institutions a strong relationship has been build up over time. Through CERIM the project partners were able to further strengthen these domestic networks with key regional players, but also to broaden their international contact network with scientists and institutions abroad. Some TTIs are already able to use their international cooperation activities to support the establishment of spin-offs in Europe.

### ***Needs-oriented services***

Today, the services offered by TTIs in the regions concerned aim to be in line with the different needs of entrepreneurs. Some TTIs offer a holistic approach, offering all kinds of services demanded by researchers, combining entrepreneurship education with hands on consultancy. The TTIs cooperate in the most cases with incubators or are themselves able to offer the infrastructure need by spin-offs.

A majority of TTIs is strong in the creation of innovation support structures in general, the creation of spin-offs, and the implementation of R&D and innovation projects for industry. Another strength is that most of the TTIs are relatively small size, and thus able to work very flexible towards both researchers and companies.

### ***Relevant research base***

According to the CERIM project partners, a growing number of researchers in Central Europe show more trust towards technology transfer activities. Also the quality of research results and innovative ideas is seen to be a good basis for technology transfer in general.

## **Weaknesses**

Most of the CERIM partners experienced the following weaknesses in their regions:

### ***Lack of special business oriented professional skills***

Despite of the strong knowledge base regarding technology transfer in most of the regions in Central Europe, some region are still lacking professional skills related to innovation awareness and management in general (e.g. Slovakia) and/or to certain business fields specifically (e.g. Salzburg area). Special business areas where knowledge may be increased are IPR management and related services, know-how on how to access international financial sources for innovation development, and knowledge about the domestic commercialisation potential. Some countries like Slovenia lack further regular personnel training. Overall, the lack of general and special business oriented skills influence the services offered by TTIs.

### ***Insufficient maturity of research cases***

One important weakness that was stated by nearly all participating TTIs is the insufficient maturity of research cases, i.e. that research results are not able to be commercialised in the near future. Reasons for this lie amongst others in the lack of resources, capacities, motivation etc. Also the attitude of scientists contributed to this as inventors were unable to continue the cooperation with industry as a top priority for longer time. Even though SME are perceived as very interested in cooperating with universities and TTIs, they do not always have knowledge about what to expect from academic research. Neither do some have enough funds as well as patience to carry out research projects over a longer period, especially since the success is not guaranteed.

Moreover, a majority of public institutions coping with research and development are not sufficiently oriented towards applied research, partly due to the overall low demand for research outcomes from private companies, or communication and information barriers between science and business environments.

### ***Lack of funding for technology transfer activities***

Some of the Central European regions (e.g. Hungary) lack financial support for certain technology transfer activities, e.g. for financing patenting. In Slovakia, only a few financial and legal support measures from national authorities exist in general. In addition, the availability of venture capital is very limited in some regions of Central Europe and only a few TTIs have an own venture fund. Furthermore, public institutions, universities and research institutions are under growing financial pressure, and are thus not intended to finance the implementation of innovative technology transfer models, in particularly in Italy. A reduction in the amount of state orders in Slovakia erases further significant portion of funds for research institutions aimed mainly to application projects. In some of the regions concerned TTIs do still not receive permanent public funding, e.g. in Slovenia. They rather need to apply for funding on a project base, which is not perceived as a long-term solution by the organisations. As a result of the current financial situation in Central Europe, existing offers and services need be combined and bundled and in some cases also adjusted and extended.

### ***Organizational problems***

A majority of the project partners pointed at problems related to the own organisation. In particular the reduced human resources due to the increased financial pressure are seen as a weakness in order to improve technology transfer in Central Europe. In a few cases, the organisation experience even lack of the operative management, clear responsibilities and inner communication as well as a reduced motivation of staff involved in technology transfer. With regard to some TTIs even the organisational structure is not perceived as optimal. At the University of Zilina, a formal technology transfer office does not exist yet, however a separate unit at or near the university is requested. Today, many research and development projects are run at the university, mostly financed from EU structural funds. However, due to the high administrative burden, further commercialisation of research results is often missing. Other weaknesses stated were a concentrated management as well as the organisational separation of founding consultancy and university patent management.

### ***Problems associated with marketing and the business model***

According to the CERIM project partners, some TTIs in Central Europe are lacking a focused marketing strategy and/or a successful business model. In case of a non-successful business model or an inefficient marketing strategy, adaptations were not always undertaken. Furthermore, a few TTIs pointed out that there is a lack of focus on the level of projects and target groups.

### ***Underdeveloped innovation infrastructure***

Especially in Slovakia, the innovation environment is perceived as still not fully developed. Here, the awareness regarding innovation benefits is still low among policy makers, researchers and companies. One of the main problems in Slovakia is further the large amount of foreign-owned company, which are not supporting Slovak research institutions. With the acquisition of a Slovak company by foreign investors, established relationships between industry and academic research did often not continue. A few other Central European regions stated further that the base for technology transfer projects is still small due to the less developed industry in the region.

### ***Missing or unclear relationships***

Organisations in Central Europe working with technology transfer are still missing relationships with important parties. In one region in Slovenia, networking is e.g. limited due to an unclear relation to and missing cooperation with the local university and its faculties. As a result, researchers are facing different contact points at the university, some with overlapping services such as IPR protection.

The coordination of technology transfer and the cooperation between research institutions and businesses is seen as important issue in most of the regions in Central Europe. Due to the lack of national cooperation some organisations lack further the knowledge for successful networking and/or are not able to contribute to policy-making.

Some of the regions also pinpointed the excellent professional network within the region, while there is a lack of acquiring new partners from outside of the region.

## **Opportunities**

The opportunities for technology transfer institutions that the project partners see in their regions are:

### ***The researchers' demand***

The demand for the TTIs' services derives from the fact that researchers (particularly at universities) are interested in finding applications for their research results. Furthermore, researchers need help in finding the right partners for commercialisation as well as support to apply for and administrate grants. Also seed and venture capital is perceived as important at this stage of development, resulting in a higher motivation of researchers to contact TTIs.

### ***Increasing national and regional importance of innovation management***

Today, innovation management is increasingly addressed by policymakers on a regional and national level. While innovation has already been an important topic in the German regions for the last couple of years, Slovakian and Slovenian policymakers have recently given growing attention to a systematic approach in innovation. The implementation of new RISS and NPVŠ strategies in Slovenia is for example resulting in new opportunities for TTIs in this region of Central Europe. Another example for the increasing importance of innovation management is the new Italian Intellectual Property Codex that recently has been approved by the government.

In addition, innovation management is a highly prioritised in the management of small and medium-sized enterprises. These companies are thus important potential clients for TTIs. In Italy, private actors operating in IP management and research valorization show increasingly interest in cooperating with public bodies. Moreover, the increasing popularity of innovations related to e-commerce and clean technologies has made innovation management a central aspect in all parts of Central Europe.

This stronger market of innovation management results in more potential clients, but also in the need for a higher quality level in the TTIs' services.

### ***Development opportunities in innovation infrastructure***

One of the main opportunities for TTIs in Central Europe derives from the existing innovation infrastructure. The backwardness regarding technology transfer in some of the regions concerned constitutes a major project potential. Some of these regions may benefit from the creation of a national technology transfer system, where opportunities for TTIs may for example arise from an increased budget for research institutions. Furthermore, TTIs in these regions are not completely formed yet and still lack relevant competences. On the other hand, already established TTIs – like those participating in the CERIM project - have the opportunity to act as a best practice model in their region and enrich their team with skilled person out of entrepreneur lectures (e.g. for the University of Zilina in Slovakia).

Another crucial area is the process of technology transfer itself, where it is absolutely necessary in some of the regions in Central Europe to establish a separate technology transfer office, either as an internal entity or an external one with close links to university researchers.

Also TTIs located in the proximity of dynamically developing urban areas like Vienna (Austria), Brno (Czech Republic), Gyor (Hungary) and Bratislava (Slovakia) offer relevant opportunities through synergy effects. In Slovakia, the further development of national competence centres as national hubs of industry oriented research and development is an additional opportunity regarding the infrastructure for innovation.

### ***Existing networks***

Broad and well established networks are of particular importance, both in an early phase of technology transfer and for a start-ups' market entry. Existing network are thus another opportunity that may be used of TTIs to develop their businesses. TTIs in Central Europe have a wide list of potential strategic cooperations, e.g. with organisations in the US and the UK, and have the aim to foster partnerships and networking on a regional, national and European level.

### ***Existence of funding opportunities for innovation***

Innovation is regarded as important in the European Union and thus financially supported by different programmes. Central European actors in the field of research, development and innovation thus have the opportunity to apply for funding, e.g. through Framework Programmes and structural funds. Accordingly, the universities' innovation potential may increase resulting in a higher number of high-potential research results. In addition, SMEs can be supported by means of equity, loans or guarantees through the European JEREMIE funds (Joint European Resources for Micro to Medium Enterprises). A larger number of SMEs is thus able to become a potential buyer of screening methodology and research results.

Moreover, the appearance of new venture capital funds in Hungary makes it easier for innovators to receive financing for their scientific projects. Venture capital funds are in this region seen as potential strategic business partners of TTIs.

## Threats

The following threats for technology transfer have been identified by the project partners :

### ***Expected economic crisis***

The main threat for improving the technology transfer situation in Central Europe is – according to the project partners - the expected economic crisis. As a result of a reduction of financial resources for universities, there might be a lack of new research and development project. Furthermore, the discontinuation in project activities might lead to a loss of current personal and/or to the decreasing motivation of the staff from TTIs involved. In times of financial crisis, advisory is moreover not considered as a service to pay for, resulting in increasing competition among TTIs and decreasing demand per organisation. In addition, also other institutes at universities may act as competitor not collaborators.

### ***The researchers' attitude towards commercialisation***

Another identified threat is the lack of trust amongst researchers towards non-academic organisations. This leads to an insufficient cooperation between TTIs, researchers and other commercialisation partners like SMEs. A researcher's efforts concerning entrepreneurship compete further continuously with the goal to habilitate, and thus influence his/her behaviour.

Another legal change in Slovenia will result in both opportunities and threats for the improvement of technology transfer: The status of researchers and professors as civil servant will cease.

### ***Partly underdeveloped models for technology transfer***

Some of the regions in Central Europe (e.g. Slovakia) claim that their processes regarding technology transfer are still underdeveloped. However, they have insufficient experience with 2<sup>nd</sup> generation models for technology transfer. Other identified threats are the poor implementation of strategies and programmes in some of the regions as well as the low level of research results claimed as innovations. Furthermore, in some regions the focus lies on the TTI as organisation and not on the technology transfer skills of experts employed. In some of the Central European regions there is still a lack of enough experts in technology transfer management. A few TTIs, threats are also associated with changes in the organisation's structure or the services offered. Examples are a holistic start-up support (one-stop agency) and the offer to provide founders with financial aid in the seed and patent phase.

## STRATEGY

The weaknesses and opportunities regarding technology transfer identified by the project partners constitute a foundation for a new Central European strategy. Accordingly, it is proposed to prioritise future actions on the following five areas in order to improve technology transfer in the region:

- i. Improvement of technology transfer skills through education
- ii. Adaption of the TTIs' business model and marketing strategy
- iii. Adaption and/or new prioritisation of services provided
- iv. Improvement of the researchers' attitude towards commercialisation
- v. Strengthening of trans-regional and international cooperation

# ACTION PLAN

Based on the strategic action named below, the following plan with 15 actions has been developed.

## ***Improvement of technology transfer skills through education***

1. Education regarding case management and evaluation of research cases
2. Education regarding the communication with companies and investors
3. E-Learning platform on IPR-management and licensing in general and legal principles specifically
4. Best practice and learning seminar on start-up management

## ***Adaption of the TTIs' business model and marketing strategy***

5. Development of new standards and reliable technology transfer processes from academy to industry resulting in a manual on rules, procedures and internal support measures for important issues such as IPR-management and licensing
6. Development of a new or adaption of an existing marketing strategy for all target groups including a clarification of the organisation's position in the innovation system as well as for each offered service a clear pricing strategy and promotion material with references

## ***Adaption and/or new prioritisation of services provided***

7. Self-assessment and peer review regarding existing offers and services, and adaption of services according to the results

## ***Improvement of the researchers' attitude towards commercialisation***

8. Seminars for researchers and students presenting case studies for successful technology transfer and providing entrepreneurial skills (e.g. legal knowledge)
9. Increased usage of and information about available grants
10. Development and establishment of a formal reward processes for researchers' engagement as well as improved incentive advisory
11. Trans-regional or international Founder-Roadshow to give feedback to ideas, connect founders and support cross border collaboration
12. Events for matchmaking between researchers and companies from relevant branch

## ***Strengthening of trans-regional and international cooperation***

13. Learning seminar regarding intercultural communication and behaviour to improve cross boarder collaboration
14. Topic-oriented events with informal character for (potential) intermediaries in technology transfer
15. Connection with Enterprise Europe Network and groups related to EU-funded programmes in order to access potential partners and important information