Regional Situation Analysis on the Innovative potential of the West – Transdanubian Region

Written by Pannon Novum Nonprofit Ltd.
on behalf of West Pannon Regional Development Company

November 2009.
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PART I. Executive Summary

Hungary has made very significant progress last decades in building a market-oriented, competitive economy which is fully integrated into the European Union (EU) and the world economy at large. In the process of EU enlargement, Hungary has moved closer to the core of the European market. For some time prior to the recent downturn, Hungary’s economic growth was well above that of the more advanced countries, resulting in the convergence of its gross domestic product (GDP) per capita.

Insufficient innovation capability is among the factors preventing Hungary from better adjusting to evolving competition, notably from emerging economies, and from seizing the opportunities arising from technological change and globalisation. OECD countries’ experience shows that government policy can play a decisive role in improving innovative performance by establishing favourable framework conditions and adopting policy measures for overcoming specific market or systemic failures.

Hungary should strive to make good use of the opportunities provided by the increased funds to be made available for investment in R&D and innovation by the European Union in the new planning period (2007 - 2013). Efficient use of these resources will require a clear strategic orientation, well-functioning governance mechanisms in science, technology and innovation policy, a strong commitment, and the adoption of good practices in implementation. (OECD 2009.)

In summary, the regional innovation system in West Transdanubia is underdeveloped to the above mentioned regions. Number of modern policy methods have been initiated at regional and national level. The most important problems regarding to the regional innovation policy are: a highly centralised system, very limited regional autonomy in RTDI policy, dependence of regional innovation policy on the national frameworks, and no significant regional financial resources.

At the same time, West Transdanubia lags behind in research and development. The decrease in industrial production and productivity can also be interpreted as being linked to low R&D activity. A further aspect is that the small- and medium-size companies are not able to integrate the most recent results of R&D into the production processes, i.e., participate in spin-offs. Developing small- and medium-size businesses is likely to be one of the top priorities in economic development of the region.

West Transdanubia can also be seen as one of the most innovative regions in Hungary. The first industrial park in Hungary was established there, the first innovation centre (excluding the capital Budapest) was also founded there. The first and most successful cluster organisations were initiated by the region, and the Pannon Business Initiative and Network, as new policy instruments, also started in West Transdanubia. The region was among the first to have its own regional innovation strategy and was a pioneer in developing a new technology foresight programme.
However, several important developments have occurred in regional innovation policies in Hungary in the last years (establishment of regional innovation agencies, regional university knowledge centres, cooperation research centres, Innocheck programme, regional innovation development), but almost all the new measures have been launched by the central government. Only in very few cases have policies been designed jointly with the regional players. Despite the lack of regional resources, several new, innovative measures have been launched in the last decade.

The key sectors for future economic development in the region should be those identified by the technology foresight programme: mechanical engineering (automotives, electronics, and mechatronics), tourism (health tourism and rural tourism), environmental industries (wood and furniture industry, environmentally friendly resources and technologies, renewable energies), knowledge industry (education and research activities), and some horizontal sectors such as information and communication technologies, logistics, and transportation. In most of these sectors, network building has already been started. (Grosz 2007.)

In the future, networks, clusterisation, and SMEs have to be given central priority in the development of innovation and R&D policy. The programmes of innovation centres, clusters, and other development organisations have to focus on the improvement of the innovation capacity of SMEs and the support of their innovation activity. Fostering cooperation and mutual learning are likely to be crucial measures in such a context.

In the last decade, a completely new regional innovation system has been formed in West Transdanubia, including new innovation centres, new cluster organisations, new university based knowledge and research centres, a new regional innovation agency and council. To date, the most important elements for a regional innovation system are present within the region. In the next few years, the main task will be to fill out the interstices of the “hard” elements, i.e., infrastructures, organisations, and institutions, with the “soft” elements of development requirements, e.g. knowledge and intellectual capital formation. (Grosz 2008.)

In the last few years, the existing key players in the regional innovation system have established very good partnerships and cooperation with their foreign counterparts especially in Austrians. Such cooperation has not only had a direct impact on real output, it has allowed for a sustainable knowledge transfer on innovation policy and management. In more recent years, connections to Slovakian partners have also gained in importance for regional actors.
PART II. Report on regional situation of the West - Transdanubian Region

II.1 Introduction

Hungary is a small, centralized country: the capital Budapest is the political, economic, educational, cultural, and transport hub.

The country is composed of 19 counties and the capital Budapest (NUTS 3 level), which are the traditional subnational level in administration with local governments. However, they do not have any decision-making power concerning education, research, technological development, or innovation (RTD I) policies. Moreover, they are simply too small to act as catalysts for regional development.

It is for this reason that these 19 counties were merged into seven so-called statistical-planning regions (NUTS 2 level) in preparation for joining the EU.

Nowadays, these regions are undergoing several important development processes; however, there are no elected local governments at this level, only delegated bodies such as regional development councils which operate with limited competences and financial background, thanks to the highly centralised system.

One of these seven regions is West Transdanubia, which is located in the western part of Hungary. Although the official name of the region is West Transdanubia most of the regional organisations use the name Pannonia which is the Latin name for the western part of Hungary stamming from the Roman era—instead of Transdanubia and west Pannon Region of west Transdanubia.
West Transdanubia was not among the highly industrialised regions of Hungary during the socialist era, so the crisis of collapsing industries and increasing unemployment rates following 1989 was moderate compared to other parts of the country.

However, West Transdanubia did have some key sectors, which had to be modernised after the system change in 1989. The most important sectors were mechanical engineering, the textile industry, and the food industry. In the last 15 years, West Transdanubia has become one of the most dynamic regions of Hungary.

Thanks to RDI (especially from Germany and the neighbouring Austria). In 2003, the region’s GDP per capita in PPP indicator reached 69% of the EU-27 average. A series of major industrial companies have been settling in the region and provided remarkable activities in the automotive and electronics sector. Some of these foreign direct investments have been attracted by the low cost workforce, so low value-added production activities are significant in this area. This is also in line with the relative lack of R&D and results in a lack of knowledge-based economic development. Local SMEs benefit from growing industrial prosperity only at a relatively low rate (Grosz 2007).

The RDI that came to the region in the last 15 years brought new technologies, new management methods, improved the skills of the labour force, and thus contributed to innovation capacity.

The region was able to adopt successful new organisational models, techniques, and development tools faster and more easily than other regions in Hungary. Industrial parks, innovation centres and incubators have been established in order to stimulate innovation, start-ups, and SME activities, and networks and cluster organisations have been founded to encourage cooperation activities. However, there is still a significant lack in the networking and management know-how needed to implement these strategies successfully.
General situation of regional entrepreneurship and innovation capacity

Regional R&D Competencies

Research and development activities stimulate the economic development and improve competitiveness. At the beginning of the ’90s, R&D activity in West Transdanubia was decreasing due to decreasing demand and lack of financial resources. Most of FDI in the last decade didn’t include any R&D activity. However, in the last ten years, a dynamic increase has been seen in the number of research units, researchers, and research themes in West Transdanubia.

Nevertheless, the research and development potential of the region lags far behind economic performance and does not reflect population share (Grosz/Smahó, 2006). In terms of R&D indicators, the region is among the weakest in Hungary. The total R&D expenditure in West Transdanubia is only 0.3% of GDP, far below both the EU and Hungarian average. The number of research units in the region is below 200, most of them are affiliated with universities and higher educational institutions, in particular with the

- University of West Hungary in Sopron and Mosonmagyaróvár,
- Széchenyi István University in Győr, and the
- Pannon University in Keszthely.

There are only two academic research institutes in the region—also situated in Sopron and Győr (the Geodetic and Geophysical Research Institute and the Centre for Regional Studies).

Until 2005, there were no research institutions in the region really capable of serving the needs of key business sectors. In the last years, two university knowledge centres and two cooperation research centres have been established at the two universities, incorporating regional firms and addressing their respective R&D needs (Csizmadia/Grosz, 2006).

These centres are establishing industry-science links in the areas of automotive industry, electronics, wood industry and renewable energy. R&D activities are not really significant within the enterprise sector, since at multinational companies most high-tech solutions, manufacturing processes, and finished parts are delivered to Hungary as part of the international trade flows (e.g., at Audi, LuK, GE, Magna, Edag).

Owing to the spatial concentration of universities in the region, R&D competencies exhibit notable disparities, the main focus lying on the northern part of the region (Győr, Sopron) (Csizmadia/Grosz, 2006). The number of R&D personnel in West Transdanubia is only 1,500, the lowest among the Hungarian regions.
Overview of R&D in West Transdanubia

The R&D competencies of the region are connected to the most important education fields of the large higher educational institutions in the region and, of course, to the key sectors of West Transdanubia, where evidence of cluster formation is becoming ever stronger. The most important fields here are:

- The automotive sector, especially in the area of Győr; focused on the Széchenyi István University-based R&D centres and the R&D activities of a growing number of automotive firms;
- Electronics and mechatronics, mainly based on business R&D activities;
- Renewable energy and technologies, especially at the University of West Hungary, but emerging at the Széchenyi István University as well;
- The wood and furniture industry and related technologies at the University of West Hungary and based on firms in the Zala and Vas counties;
- Agriculture and food industry, based at two university, faculties in Mosonmagyaróvár and Keszthely.
Most promising sectors-progress

Some industries that were considered formerly conventional - as food, light or textile industry - have been depreciated and continue to lose their role, while machine industry - also with a hundred years’ tradition - checked after the collapsing eastern markets, then it was gradually renewed - firstly with the appearance of multinational investors (Audi, Opel, Flextronics, General Electric, etc.).

Within the machine industry, unambiguously dominant branches are: car industry, as well as manufacture of electrical machines, instruments and communication engineering. Dynamically growing sector is industrial gas production branch of the chemical industry, which is built on natural resources. (Natural occurrence of carbon dioxide with the biggest extension in Central Europe can be found at Répcelak.)

Leading Sectors

In terms of investment per capita, the West Transdanubia Region ranks second after Central Hungary (including Budapest as well), scoring considerably higher than the national average. The same is true for GDP, where West Transdanubia is the second strongest region within the country. The region’s economic structure is well balanced; it is based on a number of pillars and ranks above other regions in terms of attracting foreign capital, the ratio of industrial investments, and industrial exports (ROP 2007).

In terms of economic performance, the industrial centres that were the most capable of attracting foreign working capital have acted as the drivers for development: Győr, Szombathely, Sopron, Sárvár, Mosonmagyaróvár, as well as Szentgotthárd and its vicinity. Dynamic economic restructuring has not taken place evenly across the region and there has been a further increase in existing regional differences (between more developed Győr-Moson-Sopron and less developed Zala) (Grosz 2007).

Almost 99% of the enterprises of the West Transdanubia Region are small or micro-businesses employing 50 people or fewer. Overall, they employ considerably more than half of the employed workforce. However, they account for much less than 50% of the GDP, and their portion of exports is even smaller (60% of all exports of the region originate from the industrial parks). It is obvious, therefore, that developing this sector may yield considerable economic growth.

In order to decrease the vulnerability stemming from the high mobility of foreign capital - i.e., if the region wants to prevent multinational companies from relocating away from West Transdanubia - and in order to sustain the region’s competitiveness, it is essential that the existing economic development model be transformed. The current model relies on the attraction of foreign capital involved in low-complexity production using low-cost labour. The new innovation-driven economic development model should be based on competitively priced, skilled labour that is involved in the development and production of complex products, on continuous innovation, and on further attracting as well as internally developing R&D and innovation-oriented companies (Grosz 2006).
Corresponding with the most important sectors of the region, cluster initiatives have been launched continuously since 2000.

These initiatives are aimed at promoting cooperation and interaction between companies and providing special services as well as infrastructure for the key sectors that play a dominant role in the economy of the region:

- automotive industry,
- electronics,
- mechatronics,
- wood and furniture industry,
- environmental technologies,
- alternative resources,
- health tourism,
- medical tourism,
- logistics

as well as for related and supporting industries (Csizmadia/Grosz 2006). They are based on developing a highly skilled workforce in line with the expectations of the clusters, and on providing new technology and technical infrastructure. The objective is to improve the competitiveness of the enterprises already operating in the region and to launch new enterprises. In line with strategic community guidelines, the region is consciously concentrating on achieving an economic situation which is in line with its requirements and possibilities, where the basis of growth is innovation and entrepreneurial intellectual potential (ROP 2007).
Main problems-obstacles in development of innovative SMEs

Innovation or research activities of the enterprises are with high probability significantly influenced by the innovative milieu experienced in the region. In the following we will examine conditions for the implementation of innovation; our intent is to assess innovative ability of the region by qualifying various facilities/capabilities of the region - to what extent do they promote development and innovations in their present state. This analysis was performed both for the total and for our innovative sample. Rating was carried out on a one to three scale where grade one meant a high, grade 2 a medium, and grade 3 a low quality, resp.

Evaluation of the implementation conditions for innovation in the West Transdanubia region (all enterprises)

<table>
<thead>
<tr>
<th>Conditions (in the order of quality)</th>
<th>How many % of the enterprises marked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Appropriate suppliers and contractors</td>
<td>15.6</td>
</tr>
<tr>
<td>Properly trained workforce</td>
<td>12.5</td>
</tr>
<tr>
<td>Consulting services</td>
<td>12.6</td>
</tr>
<tr>
<td>General business environment, climate</td>
<td>6.8</td>
</tr>
<tr>
<td>Research capacities and supply</td>
<td>7.8</td>
</tr>
<tr>
<td>Availability of venture capital</td>
<td>5</td>
</tr>
<tr>
<td>Cooperativeness</td>
<td>4.3</td>
</tr>
<tr>
<td>Supply of capital (availability of gen. financial sources)</td>
<td>3.5</td>
</tr>
<tr>
<td>Solvent demand for innovation</td>
<td>4.5</td>
</tr>
<tr>
<td>Innovative and economical support</td>
<td>4</td>
</tr>
</tbody>
</table>

*Total number of enterprises: 401

Similarly to the results of other research, the two most outstanding capabilities are the appropriate suppliers and contractors, as well as the properly trained workforce. Existence of the appropriate suppliers and contractor were graded by 17.8% of the West Hungarian enterprises as high quality and 55.5% as medium quality. Taking only the innovative companies into account, the same numbers are 19.7 and 52.5%, resp. Based on results of the Eurostat CIS4 survey published in February 2007, between 2002 and 2004 for 17% of the innovative enterprises in the EU27 countries the co-operation partner meant the suppliers (Fourth Community Innovation Survey 2007).

This ratio is much higher in Hungary, it is 26%. According to our survey, quality of the properly trained workforce was graded by 13.6% of the companies of the region as high and by 59% as medium. For the innovative companies the same numbers are 15.1, and 53.6%,
resp. Third best feature among the factors is the existence and availability of consulting services; quality of this feature was rated by 18.9% of the companies in our representative sample as high and 39.8% as low, while the same figures for the innovative companies are 20%, and 43.4%, resp.

**Evaluation of the implementation conditions for innovation in the West Transdanubia region (innovative enterprises)**

<table>
<thead>
<tr>
<th>Conditions (in the order of quality)</th>
<th>How many % of the innovative enterprises marked?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Appropriate suppliers and contractors</td>
<td>17.9</td>
</tr>
<tr>
<td>Properly trained workforce</td>
<td>14.4</td>
</tr>
<tr>
<td>Consulting services</td>
<td>14.5</td>
</tr>
<tr>
<td>General business environment, climate</td>
<td>9</td>
</tr>
<tr>
<td>Research capacities and supply</td>
<td>12</td>
</tr>
<tr>
<td>Availability of venture capital</td>
<td>4.5</td>
</tr>
<tr>
<td>Co-cooperativeness</td>
<td>4.5</td>
</tr>
<tr>
<td>Supply of capital (availability of gen. financial sources)</td>
<td>4</td>
</tr>
<tr>
<td>Solvent demand for innovation</td>
<td>5</td>
</tr>
<tr>
<td>Innovative and economical support</td>
<td>5.5</td>
</tr>
</tbody>
</table>

*number of innovative enterprises: 201


There were not much differences between how enterprises in our total sample assessed innovative conditions of the region, vs. how those in our innovative sample did the same (only two parameters, i.e. availability of venture capital and availability of general financial means change places), so only assessment of only companies from the total sample will be shown in the following. Forth parameter in the ranking is the general business environment, the ‘business climate’ - a factor indicating innovative capacity of the region -, which is followed by the research capacities and the supply.

Availability of venture capital is in the sixth place, followed by the cooperativity, the capital supply, and the solvent demand for innovation. Last in the line is the innovative and economic support, which was graded as high only by 4.8% of the companies in the representative sample, and graded as low by a significant portion (61.1%) of them. Innovative and economical support is not available for 16.8% of the companies. Looking at the innovative enterprises, the picture is somewhat more favourable, though only 6.2% of them graded innovative and economical support in the region as being high. Results are calculated by counting in the ‘not applicable’ answer.
Initiatives, regional programmes & tools supporting innovative entrepreneurship

Governance and Policies

As mentioned above, the most important governmental organisations at regional level in Hungary are the regional development councils, which are not elected but delegated bodies. Their executive bodies are regional development agencies. However, budgetary and administrative decisions are still prepared on a county level; only on certain necessary developmental and administrative issues does the regional level have decisional power.

Organisations of Governance and Development

The region of West Transdanubia has no elected body. In 1997, the West Pannon Regional Development Council was established by law. In participation with the counties Győr-Moson-Sopron, Vas, and Zala, it is responsible for regional development and town and country planning. It is made up of representatives from the counties, cities with county rights, the small regions, and of ministries. It is strongly tied to the national executive level and therefore has to follow national policy guideline. Its most important tasks are the operating of the competition systems in connection with decentralised resources, the programming and planning at regional level, and the regional coordination of the development of the economy.

Regional Development Council

The law about regional development and town and country planning adopted in 1996 created the basis of the institutions of regional development in Hungary, thus also the establishment of the independent regions. In 1997, the West Pannon Regional Development Council was established with the participation of the counties Győr-Moson-Sopron, Vas and Zala. The Council was re-formed in 1999 then in 2004 because of the obligation of the rule of law.

In the Council, the presidents of the councils of territorial development of the counties, the mayors of the five towns of county rank of the region, the representatives of the small regions, the chairperson of the Regional Tourist Council, as well as the 11 representatives of the government delegated by the ministers have right of voting, thus the number of members is 23.

During the working and activity, the Council pays a high attention to the wide publicity, so the number of the permanent invited guests is approximately 200. It was the first among the regions which opened up the materials of the meetings on its web site. The Coordination Committee helps the Council to assume its responsibilities, while the Council co-operates with the professional authorities and organisations of the region considering partnership and professional attitude.
Role of research & technology parks - business parks, clusters

Clusters

The newly established cluster initiatives aim to promote the clusterisation processes in an individual branch by stimulating cooperation among enterprises and between business and nonprofit organisations (higher education, research, special services, infrastructures), by providing cluster specific services, and by accelerating the flow and spread of information.

Cluster organisations in the region are important tools for creating and forming the missing elements of regional innovation systems and for improving the relationships among the different elements of the whole system. Cluster management, members, and related professional bodies, institutions, and associations possess the specific information required for the development of the given sector or cluster.

They can identify the most important development directions and mobilise relevant enterprises, as well as formulate and articulate inputs for policy decision makers and development players. Cluster organisations contribute to the improvement of the innovation environment of the region by supporting cooperative activity and the spread of best practice among cluster members (Grosz 2006).

From 2000 to 2005, five cluster initiatives were established in the region, but two of them were not really successful. Experience and sector analysis led to further clusters being founded at the end of 2005. In 2006, as we mentioned before, the so-called Pannon Clusters decided to found an association, a network for the coordination of their work and activities and to intensify investment in West Transdanubia by supporting the cooperation of the 23 industrial parks in the region (Pannon Business Network 2006).

Business Parks

Economy developmental and rural developmental political means which were applied in the West Transdanubia region from the beginning of the 90’s were primarily those with the aim of an effective and fast transformation of the industrial and economic structure, the prevention and management of employment issues, creation of the basis for a dynamic economic growth. One of the most important elements of these means is formation of Business Parks. Of course, formation of Business Parks was started first in the most important industrial centres of the region at the early 90’s with the aim to provide prepared, industrialized areas equipped with wide infrastructure for the foreign investments which, sold on a discounted price and connected with tax and other preferences can promote the transformation of the economic structure of a given township and the creation of workplaces.
II.2. Specific characteristics of the region under study

II.2.1 General Situation in the region and regional indicators

Geographical location/ characteristics and their effects on the economic, industrial etc. opportunities

General Introduction

The 7 statistical-planning regions were accepted in Hungary in 1998 with a parliamentary decision.
The West Transdanubia region consists of three counties: Győr-Moson-Sopron, Vas and Zala. It is stretching long in the North-South direction.

The region has borders with for countries: with Austria to the West, with Slovenia and Croatia to the South-West and with the Slovak Republic to the North. The region’s neighbours are Central Transdanubia to the East and South Transdanubia to the South.
The region’s 11,183 km2 area is 12% of that of Hungary; from this Győr-Moson-Sopron lies on 36%, Vas occupies 30% and Zala 34%.

Natural geography of West Transdanubia shows a significant variability. There are three landscape units on its area: the Small Plain, Alpokalja (feet of the Alps) and part of the Transdanubian Hills, complemented by the Northern and Western shoulders of the Transdanubian Medium Mountain. The landscape with a diverse surface is rich in watercourses and natural or artificial lakes. There are several natural reserves of national protection on its territory (Fertő-Hanság National Park, Órség National Park). As regards natural resources, the region is rich in thermal and medicinal waters in the first place, in almost even distribution.

West Transdanubia is rich in natural treasures and resources, conservation of which is an equal environmental and economical interest, their mild utilization is a big opportunity and task of the sustainable development.

Serious environmental problems do not endanger the region, despite the significant industrial centres. After change of the political system, manufacture in several out-of-date industrial sectors that caused much harm to the environment (e.g. textile industry, machine industry) were ceased, reduced or transformed. Another factor that was also reduced is the extent of environmental load coming from agricultural activities, primarily due to an opening of the agricultural gap. Hence natural systems are characterized by a relative integrity. Conservation of the high biodiversity is important both from environmental and from economic (tourism) or social (quality of life) respect.
The West Pannon Region

The West Pannon Region (NUTS II) has a unique geographical position in Europe: it is located at the meeting-point of 5 countries: it links Hungary with Slovakia, Austria, Slovenia and Croatia, and its inhabitants speak 7 languages. The region has an open urban network – Győr and Sopron serve as bridges to Bratislava and Vienna, Szombathely and Zalaegerszeg provide link towards Graz and Northern Italy, whilst Nagykanizsa does the same towards Zagreb – for the benefit of Hungary.

The region made up of Győr-Moson-Sopron, Vas and Zala counties (NUTS III) constitutes 12.2 % of Hungary’s area (its territory occupies 11 329 sq. km). Around 10 % of the country’s population live in the West Pannon Region (on January 1, 2004: 1,003,185 people).

The settlement network of the region has special features which are to be taken into consideration when fulfilling public duties adequately on an acceptable level, and with regard to the regional policy as a whole. Namely, the settlement network of the region is characterised by an exceptionally high proportion of small and tiny villages in addition to the poly-centric urban network conditions. The settlement network is formed by 626 municipalities and 29 towns.

The exceptional high proportion of the small and tiny villages within the municipalities is a particular feature of the area. More than half of the municipalities in the West Pannon Region are small villages with a population of less than 500 people, and within this rate, 122 settlements are considered “tiny villages” with a population of less than 200 people, where the proportion of the elderly people is exceptionally high (on average 30%).

Pannon urban network: the poly-centric network of 29 towns is an organic part of the European urban network. The settlements around the five (!) towns with county rights are in different states of the agglomeration. The population concentration of the three county seats is typical. Eight towns with a population between 10-30 000 have regional central functions determinant in the poly-centric urban network of the region, and 16 towns (with a population less than 10 000 people) have important micro-regional functions.

The viability of small villages is the key issue of the region. Half of our settlements has a population of less than 500 people, which require innovative and nature-friendly regional development means, and renewal from us.

The economy of the region faces a significant challenge. In addition to the activities of multinational companies mostly based on semi-skilled labour, it is imperative to stimulate the innovation-oriented activities of the SME-s, and new productive activities requiring qualified manpower should be attracted to the region. All these should be done while currently the R+D potential is the lowest in the region, and its distribution is unequal. The basis and the core of the economy of the region is formed by the processing industry, including the automobile- and electronics industry dominated by multinational companies. Agriculture is less and less
important, while services are gaining significance, which actually corresponds to both international and national tendencies.

General economic and financial services dominate the service sector. The significance of tourism-related industries has not increased although they should play a fundamental role in the development of several disadvantaged small areas in the region. There are certain challenges and shortcomings which can also be presented on horizontal, national, or even Central-European level, such as the lack of national medium-size enterprises, the low level of the integration of the multinational companies, or the problems of transport infrastructure.

The innovative of the region is to be resolved – the critical factor of maintaining the dynamism of economic is that research, development, and innovation in our region amounts to just 50 % of the national average. The pioneers of the network and regional economy are the Pannon Automotive Cluster and the Pannon Wood & Furniture Cluster.

The region has a unique natural environmental resources as far as spa potential is concerned, since it disposes of considerable assets both in quality and quantity, and is also boasts of the Hévízi-tó [Lake Hévíz], the only lake in Europe suitable for bathing throughout the year. In addition to the spa tourist facilities, there are further possibilities to be explored in the region concerning the development of cultural and heritage tourism. The tourist exploitation of the natural and land resources focused explicitly on the variety the eco-tourism elements, of which provide a sound basis to develop this area.

Our health tourism boosts our internal economy! – Half of the spa tourist nights in Hungary are generated by the thermal network in the West Pannon area, which is the basis of the largest wellness region in Europe, and the driving force of the revival of our regional services.

The special features of the terrain and settlement structure of the region cause serious problems in sewage treatment and waste management. There is no complex waste management, and waste is frequently dumped illegally. At the same time, significant development has taken place in the region, well above the national average. There is a high ratio of organised waste collection, and there many of waste dumps provided with technical protection which are in compliance with the EU and the Hungarian requirements. There has also been a remarkable improvement in the purification of waste water, but the authorisation and implementation of the nature-friendly sewage treatment, which providing an ideal solution for regions with small settlements and structured terrain with, is still hindered by problems of regulation and technical approach.

Hungary still lags behind the EU countries in the field of using renewable energy resources. This is particularly true of systems of local significance. At the same time, the settlement structure in the West Pannon Region makes it necessary to make comfortable energy supply available for heating systems in small villages.
The transport infrastructure in the West Pannon Region is basically determined by its location among four countries. The significant transit traffic of the borders has a considerable impact on the conditions of both the roads and the environment. The public road infrastructure of the region is extremely unfavourable. Although one sixth of the national road network is located in the region, and the road density is the highest here among the regions (because of the settlement structure of the small villages), its composition is unfavourable: only 6.5% of the roads are motorways or main roads.

Accessibility also poses a serious problem in the peripheral areas with numerous small villages which mostly lie at the border, and which are only accessible by one road and from one direction. The increasing congestion in the large towns of the region, the worsening environmental load caused by vehicle transport, and the inadequate public transport in the small settlements explain the necessity of improving and supporting the local and inter-settlement public transport and the standards of the services.

60% of the commercial freight traffic of Hungary take place across the borders of the West Pannon Region, and since May, 2004 traffic has increased by 35% on some of our main roads. Among the largest 10 towns in Hungary, only Pécs and Szombathely are not accessible by motorway. It takes four hours to travel from Győr to Nagykanizsa.

Education also faces special challenges in the region. Primary schools in small settlements cannot or can hardly keep up with larger institutions in a better situation in employing qualified teachers, in educational facilities, and in the accessibility to up-to-date educational infrastructure. The West Pannon Region does not play a leading role in the higher education and training system of Hungary, it is devoid of a real university centre, or a university network based on the facilities of the region including all the relevant elements of a “universitas”.

Regional inequalities in the living standard are reflected in the health condition of the population, which is especially true for the small settlements. There are considerable disparities between the counties and the micro-regions as well (concerning the diseases in the circulatory system the male population is in lead in Győr-Moson-Sopron county; Zala county takes the first place in death caused by cerebral arterial diseases, while Vas county leads in number of deaths caused by breast cancer; and mortality rate of males due to suicide and alcohol consumption caused by mental disorders is a serious problem in Zala county). A significant part of the diseases and illnesses can be effectively tackled by primary prevention. With regard to the healthcare system, it is often difficult to achieve regional conformity between certain medical services.

The use of home computers and the Internet penetration is low the West Pannon Region, but it can be dramatically improved by the spread of broadband infrastructure in the near future. In the area of regional indicators of digital literacy, a significant improvement is necessary through launching training and content development schemes based on local needs. In the case of services provided to the enterprises, the use of computers is less typical, which should be urgently improved in order to make them more competitive. The number of public access
points has only increased in the West Pannon Region in the past few years, but there has been considerable growth since then, however, their electronic services should be expanded.

The micro-regions of the West Pannon Region (22 NUTS IV regions) based on the complex developmental indices, and the location of the inner peripheries:

*Colours in the map show the ranking order based on the complex index, dark colours indicate micro-regions with more favourable features, while the lightest colour indicates inner peripheries.*

The region consists of three counties (Győr-Moson-Sopron, Vas, and Zala) with a territory of more than 11 thousand square kilometres and a total population of 1 million inhabitants. The population is slowly declining despite moderate inward migration to the region. The region does not have a designated capital but is endowed with five county towns (Győr, Sopron, Szombathely, Zalaegerszeg, Nagykaniszsa) each with 50-130 thousand inhabitants; the network of these five cities forms the basis for spatial development.
West Transdanubia is said to be the gateway of Hungary to Western Europe. It shares borders with Slovakia, Austria, Slovenia, and Croatia. Sixty-percent of Hungary’s trade crosses West Transdanubian borders, thus the region has an emphatic transit role.

The closeness to the Western European countries and their economies is very important for the region’s economic development process and, of course, for its innovation practice, both at firm and regional level. It allows for wide-scale international cooperation of local companies and organisations, and thus helps improve the innovation potential of the whole region.

Geographical Features

The West Transdanubia region consists of three counties along the Western border of Hungary: Győr-Moson-Sopron, Vas and Zala. The region stretching in the North-South direction - a unique feature - is bordered with four countries. Slovak Republic, Austria, Slovenia and Croatia. It’s neighbours are Central Transdanubia to the East and South Transdanubia to the South.

There are three landscape units on the area of West Transdanubia: the Small Plain, Alpokalja (‘feet of the Alps’) and part of the Transdanubian Hills, complemented by the northern and western shoulders of the Transdanubian Medium Mountain. The landscape with a diverse surface is rich in watercourses and natural or artificial lakes. Due to its geographical location, West Transdanubia is a colourful area with a diverse topography. Different types of topographical unit can be found in tour region: basins of great rivers (Danube, Rába) and lakes (Balaton, Fertő-tő), spacious plains (Small Plain) and hills (Hills of Vas-Zala), as well as some minor middle-range mountains (Mountains of Sopron, Kőszeg or Keszthely).

This is the reason why its natural endowments are diverse, degree of forestation and the suitability of the land for agricultural activity is strongly dependent by the part in question. While plain areas are utilized mainly as plough-lands, the hills are covered with forests, corresponding to the type of soil prevailing there. Stock of forest and game of the region is not only a prominent natural value, but also represents a high economic resource. Forestry should be transformed to be a more near-nature activity. From the agricultural aspect the local productivity of the land show big territorial diversity and by utilizing advantages in that feature there is a good chance to implement a multifunctional, diverse agriculture adapting to the endowments of the land. Owing to the geographical features and the settlement structure consisting of small villages the characteristic form is the small property, ensuring a mixed type of culture and divers landscape.

The region is rich in natural values and its environmental status is relatively good compared to the nationwide average and to the problems seen in the other regions. There are 3 Natural Parks (Fertő-Hanság NP, Örség NP, Balaton NP), several nature reserves and nature conservation areas in the region. Designation of Natura 2000 areas has been completed. From among the non-protected natural landscapes the uncontrolled section of Rába river is prominent even on a European scale. Built on the natural, landscape and cultural values, an advanced tourism was developed in several small regions.
The region is not very rich in energy sources and mineral substances. Nevertheless, from an economic point of view, its most important natural resource is certainly the stock of thermal and medicinal waters, which are abundant and erupt in a relatively uniform territorial distribution (the prominent ones: Hévíz, Bük, Sárvár, Zalakaros, Balf, Lenti). The oilfields of Zala, which were so rich formerly, are being exhausted. There are significant stocks of pebbles, clay and lignite. Their exploitation is, however, either undesirable from the aspect of landscape and environment protection, or is possible only on a limited scale. Features of the region are good as to renewable energy sources, especially in the field of wind energy, utilization of which is still a big opportunity.

Environmental Status

Infrastructure of West Transdanubia can be considered underdeveloped: states of its public roads are out-of-date (except for some main roads), their capacity is insufficient and technical condition of the railway network is also obsolete. Underdevelopment of the internal traffic connections further increases the territorial unevenness to be seen along the north-south axis. It has a significant transit traffic, due to the four country borders and the increasing international transport demand, this effect can be observed mainly along the north-south axis.

Condition of the air quality in the region is mainly determined by the traffic and the industry, and influenced by community heating. It can be generally stated that - except for the strongly industrialized towns - quality of the air is appropriate in major part of the region. However, traffic of trucks, which increased rapidly during the last decade, brought a significant deterioration along the main roads (primarily road No. 86).

Every settlement have running water, however, sewage disposal is solved in slightly more than 50% of the apartments. This is why there is a risk of a gradually enhanced contamination of the surface and ground waters, that presents a serious environmental-healthcare problem even today.

Energy saving and emission reduction can be achieved by reducing transport, development of public transportation, directing the personal and good traffic on the railway, and modernization of the cars.

There are frequent problems in the sewage and waste treatment, due to the topological and settlement distribution characteristics of the region. Wastes are often disposed of on an illegal way and there is a lack of complex waste management. Rate of the organized waste collection is high and there are relatively many waste disposal sites equipped with technical protection.

There is a powerful development in the field of sewage treatment, but there are numerous regulation and professional-attitude problems around the permission and implementation of the near-nature technologies of sewage treatment, which were an ideal solution for regions with small settlements and divided topography. In spite of all the obstacles several exemplary projects have been implemented or are in the state of preparation.

In order to its sustainable development, the region makes all efforts to support and promote utilization of renewable energy sources.
Significant attitude-forming and practical environmental and nature protection activities are carried out by the social organizations in the region and these activities should be further strengthened - considering other regions.

Novel tendencies in the environmental protection and utilization of renewable energy sources

In Vas county, the wind turbine power plant at Vép was completed and installed and a significant capacity wind power park is planned at Perenye in partial ownership of the local government. Further wind turbines are being planned in the Small Plain; more than 100 wind turbines in the Mosoni Plain and 45 ones in Rábaköz.

Within the project entitled ‘First European Solar School in Hungary’, a display and training solar lab was established in the Puskás Tivadar Vocational School at Szombathely, which is a unique establishment in Hungary.

A wood-fuelled village heating plant was built at Pornóapáti while district heating power plants was built in Szombathely and Kőrmend.

A sewage farm with alternative (reed root-zone) technology operates at Kám in Vas county.

Building of biogas power plants are planned in several townships, e.g. in Öriszentpéter and Csőrötné. An Innovation Ecocentre for Renewable Energy Sources (Megújuló Energiaforrások Innovációs Ökocentruma, MEIÖ) is established at Nagypál that is intended to be a facility for the utilization and display of solar energy, biomass and wind energy.

A power plant fuelled by organic by-products (e.g. straw) is planned to be built at Vép. The first geothermic power plant is planned to be built at Iklódbördöce, Zala county.

A ‘South-European Centre for Study of the Climate’ will be established at Sopron in the University of West Hungary.

So far the international research has not paid due attention to the effects of climatic changes on South-Eastern Europe. Majority of the region lies in the forest-steppe bioclimatic zone, where relatively small changes can bring about significant ecological consequences.

In the framework of the NEESPI co-operation, a Regional International Research Co-operation Centre will be established in Sopron at the University of West Hungary, at the Institute of Environment and Earth Sciences of the Faculty of Forestry.

From the most important fields of tourism health tourism has to be stressed. The bath culture of the region can be traced back to the late period of the Roman Empire, more towns of today, among others Szombathely (Savaria) and Sopron (Scarabantia) preserve remains from the Roman period. Because of the geological features, the region is rich in thermal and medicinal springs and can be proud of more thermal baths as well as of a steadily increasing medicinal and wellness offer.
The base of this is the richness in thermal and medicinal waters. Many thermal baths are to be found within the territory of the region: Balf (Sopron), Bük, Győr, Hévíz, Kapuvár, Lenti, Mosonmagyaróvár, Sárvár, Szeleste, Zalakaros and Kehidakustány. Developments of high level were carried out in the major part of the thermal baths, the offer of services increased by means of which their international competitiveness became stronger.

The treasures of cultural and built heritage represent a serious attraction too. From these the Archabbey of Pannonhalma, part of the world heritage, the landscape of Lake Fertő as well as the historical fortresses, castles, mansions and canonical buildings are the most important. The National Park Fertő-Hanság, the National Park Őrség, the Lake Balaton, the Lake Fertő as well as the smaller lakes and rivers offer useful spare time possibilities of many kinds. The cultural programmes are of high level and wide-ranging. Many of them have an international reputation like the "Baroque Days" in Győr, the Mediawave Festival, the Festival Weeks in Sopron and the Savaria Historical Carnival. In some towns of the region (Keszthely, Sopron) the conditions of conference tourism are excellent too.

West Pannonia is rich in treasures of viticulture and gastronomy as well as in specialities. 77 settlements of the region belong to a historical wine-growing region. From the historical wine-growing regions Pannonhalma-Sokoróalja and Sopron are to be found here with their total territory, while the wine-growing regions Somló, Balaton Highland and Balaton Region have some of their area within the region. Wine roads were established in all of the wine-growing regions, besides wine festivals, wine days, wine competitions, moreover the wine ball in Kőszeg make the offer more colourful.

There are more national parks, natural parks and landscape-protection areas in the region which have the task to preserve the wonderful natural endowments, to protect the environment, to maintain the unique flora and fauna and to safeguard the environmental treasures of the region West Pannonia. The joint aim of these organisations is to maintain the balance between the natural and built environment for a long term.

Cycling tourism is one of the most developing tourist areas. Because of the increase of demands cycle paths of many kilometers were have been built in the last period. According to available facts and figures, West Pannonia possesses more than 300 km cycling path which is more than one fifth of the national network. However, the isolation of developments raises a problem because the individual cycling paths are not connected either at regional or at international level.

The capacity of accommodations was enlarged in accordance with the expand of the tourist supply in the last years. More than 60 thousand accommodations were available in the region in 2003 which is 17% of the national capacity. The distribution of accommodations of certain counties is unequal. Because of the attraction of the Balaton, Hévíz and Zalakaros 43% of the accommodations are to be found in County Zala, 37% of them are in County Győr-Moson-Sopron and less than one fifth of them are in County Vas.
Population

Demography

Population of West Transdanubia shows a long term tendency of decrease in the last decades. Population was highest during the 1980 national census, that meant 1 million and 36 thousand inhabitants. After more then two decades, the 2001 census counted just 1 million people. In the 1st of January, 2004 there lived 1,003,185 citizens in the region, which is almost 10% of the county’s population; 44% live in county Győr-Moson-Sopron, 30 % in Zala and 26 % in county Vas. The last few years saw a slight increase, resulting not from natural growth, but is an immigration surplus. Population increment coming from immigration went to the towns or outskirts of towns of the region: primarily that of Győr, but Keszthely, Hévíz, Sárvár and Zalaegerszeg are also targets of the inland immigration. In summary, between the last two censuses a really significant decrease of population was experienced in the following townships of the region: Letenye (-6.4%), Lenti (-9.2%), Vasvár (-7.1%) and Őriszentpéter (-8.3%).

Age-related distribution of the region’s population is characterized by a low part (15%) of children /aged between 0 and 14 years/ and a relatively high part (15.5%) of the elderly /people above 65 years of age/. The aging index, which is a ratio of the elderly to the children’s population, is higher in West Transdanubia than the national average. Moreover, excluding the capital, aging index of Zala is extremely high (112.4). This would practically mean that for every child there are 1.12 elder persons, so population of the county is strongly aging.

Proportion of the sexes in the county’s population is not equal: in January the 1st, 2003, for every 1000 men there were 1077 women. This is essentially the same as the rural average, but lower then the national one. Together with the national tendency, femininity rate is increasing in the region as well, i.e. the men-women number difference is increasing from year to year. The specific feminine surplus is highest in Zala (1097 women for a thousand men), while it is the lowest in the northernmost county of the region (104 women per 1000 men). This surplus of women is strong mainly in the elder age groups and the high value in Zala is coming right from the high rate of elderly people living there.

Life expectancies are more favourable in the region than the national average, moreover, they are the best in Hungary. This concept is including the quality of life and is quantified by the expected lifetime at birth. Men born in 2003 in West Transdanubia have a life expectancy of 68.8 years, while the same figure for women is 77.4 years.

The Multinational Region

From among the 13 accepted minorities the Croatians, the Romani people and the Germans, as well as the Slovene people (with a lower population) form an independent community in the region.
In West Transdanubia territorial distribution of the historical minorities is relatively well describable. Croats live in relatively great numbers - in every three counties - in settlements in close vicinity to the border. In their villages the folk tradition is living and community of the minority represents the majority of the population in several instances. More than half of the Slovene minority of the country lives in county Vas, in villages of the Vend countryside and in Szentgotthárd. The German population forms a community with higher numbers of inhabitants in some settlements in county Vas close to the border (Pornóapáti, Vaskeresztes). as well as in Ágfalva, Kimle and Fertőrákos.

**Education**

The level of the education of the region's population increased in the last ten years. One fifth of the population can speak at least one other language in addition to his mother tongue. Because the region is situated close to the border, the rate of the German speaking population is the highest (14 %) while the knowledge of English is left behind. Education on basic and intermediate level is available for almost all of the school-aged young people, the rate of registration at school reaches almost the maximum.

In the region, especially because of the structure of small settlements in County Zala, it is hard to provide education of basic level at a high standard as close to the residence as possible.

The counties of West Pannonia show a various picture considering intermediate education. Firstly, the positions of the secondary schools became stronger in County Győr-Moson-Sopron. It may be presumed that the increasing demands of higher education realize behind the rate of the continuation of studies in grammar schools. On the other hand, apprentices streamed to the vocational secondary schools in County Vas and Zala. The educational vocational secondary school building takes place characteristically in the towns of county rank, 86 % of the institutions can be found here, while the rate of specialised secondary schools is only 63 %. Győr emerges within the group of the towns of county rank with a participation of about 40 %.

In spite of the radical changes of the last ten years, the system of vocational education was not able to adapt to the latter challenges of the social-economic transformation and of technological development and because of the weak relations of the economy. The major part of professional training takes place in the apprentice workshops of schools and not at companies. Therefore the level and the character of the skills of school leavers is not sufficiently appropriate for the demands and expectations of the labour market. There is a parallelism in the education at many places, while in other field, scarce skilled jobs appear as well.

Although there are institutions of higher education in all the five of the towns of county rank of the region, West Pannonia does not play a leading role in the structure of high education and training. The region is lacking of a real university centre or an "universitas" that possesses all of the relevant elements of a university network of the region, including all of its useful
attractions (for ex. applied research and development). The establishment of this centre would be an advantage in opposite to Budapest or the neighbouring regions concerning the combat for obtaining students.

Social and welfare system

The economic productivity of the region is above the Hungarian average, however this advantageous economic situation does not result a significantly lower poverty rate compared with other regions, which is owed probably to the disparities of income in the region, to high customer prices and to an increased cost of living. In the region, one in ten households lives from much less money than it would deem necessary for living.

Considering family aid and children's welfare activities, one-person services dominate in the small settlements of the region where a district nurse or a teacher carries out the tasks of the children's welfare in part-time. In the towns, however, the services work within the framework of institutions. Considering the services in an institutional form, the staff is excellent, while the tools as well the circumstances are mostly appropriate.

The institutions of the day-time provision of children are very unequal in the region, in County Vas and Zala they are especially insufficient. In County Győr-Moson-Sopron, there are 26 nurseries, while in County Vas 15 and in County Zala only 9. There aren't any day-care centres in the region, while the home baby-sitting functions only in County Győr-Moson-Sopron, in the small region Sopron-Fertőd.

According to the figures of the census data of 2001, 43 641 handicapped people live in West Pannonia. This figure is nationally the lowest and within the region, the situation of County Vas is the best (11 951 person). The number of handicapped people rockets among people over 40 years, one reason of this can be the acquired deficiency during one's life. According to the figures of 2004, there are 8 institutions in the region for day-care of disabled people, from these only one in County Zala. Considering the institutions that take care of disabled people, the region has nationally the worst situation. Among the regions, there are the least day-care and living-in institutions.

The region has serious problems considering the access to the providing system of addiction illnesses. In County Zala for example there is no institution that provides day-care for addicted patients, while both in County Győr-Moson-Sopron and in County Vas, there are only two. According to the providing of psychiatric patients, the situation is much worse: there is no day-care institution neither in County Zala, nor in County Győr-Moson-Sopron, and in County Vas only one institution of this kind works. In the region, there is a providing institution for homeless people in 7 settlements.
Economy- basic figures

General

Counties of the region that developed extremely rapidly in the last decade suffered significant disadvantages during their 20th century history. Following the Trianon Treaty at the end of WWI they lost significant parts of their territory. In the decades following WWII their situation close to the border, which is now an advantage, was a factor hindering their development. Settlements in the so-called ‘border zone’ - created along the border with Austria and the former Yugoslavia, because of the differences in the political systems - lived in strict isolation, which went together with a lack of developments.

Opening of the borders after the change of the political system resulted in an advantageous turn. There is a boom in tourism. International transit traffic at the four country borders is significant and these border crossings are managing about half of the country’s cross-border traffic. A strong investment activity started and foreign investors settled, which was supported by the extremely advantageous geographical location of the site. Counties Győr-Moson-Sopron and Vas have a common border with the European Union, which was an important positive factor in attracting the foreign capital into the region. It was the development of the three counties exceeding the Hungarian average that made West Transdanubia the second most developed region following Central Hungary - also comprising the capital.

Considering the whole economic space structure, basically positive processes took place in the region in the last one and a half decade. Of course, these processes did not take place evenly within the region. In the 90’s, especially thanks to the inflow of foreign operating capital, a dynamically developing regional group was formed by the county seats, places near the Austrian border, as well as by settlements along highway M1 and the neighbourhood of Balaton - 10 of the 20 small regions belonged to this regional group. The Nagykanizsa small region is basically a developing one, while the others can be classified as rising.

From the late 90’s centre of development shifted mainly to the agglomeration of Budapest and the region between Győr and Budapest. Development in West Transdanubia have appreciably slowed down, which resulted in a ‘developed stagnation’ for the majority of the regions’ area, while for the internal peripheries and regions along the southern border ‘stagnation with a moderate development’. It was only the region of Lenti where signs of dropping behind could be observed. Leading role of the county towns in the transformation of the economic structure and the dynamic development was unambiguously supported by the higher than average educational and qualification level of human resources, the stable and relatively large labour market, and the more favourable infrastructure, their central role in the region.

International transit traffic through the four national frontiers of West Pannonia is significant: more than half of the frontier traffic of the country goes through the border stations of the region. At the beginning of the 90’s, powerful investments began in the region and foreign investors of solid capital settled her. The reason for this was among others the very advantageous geographic situation. The counties Győr-Moson-Sopron and Vas border directly
on the European Union which is a very positive factor considering the attraction of foreign capital into the region. As a result of the development, the three counties are above the average national development level: West Pannonia became the second most developed region of Hungary on the basis of GDP after Central Hungary that includes also the capital.

Considering the structure of the economy, there were fundamentally positive processes in the region in the last 20 years. However, these processes do not appear evenly within the region. In the 90's, especially owing to the inflow of foreign working capital funds, the county seats, the areas close to the Austrian border, the settlements along the motorway M1 as well as the area close to the Lake Balaton created the group of dynamic developing areas, to which belonged 10 small regions out of the 20 in West Pannonia. However, the small region of Nagykanizsa was fundamentally a developing region, while the others belonged to the group of closing up areas. From the end of the 90's, the centre of the dynamic development of Hungary has transferred to the agglomeration of Budapest and to the area between Győr and Budapest.

In West Pannonia, economic development slowed down appreciably, in consequence of which the developed stagnation was characteristic for the majority of the region in the period of 1998-2002, while the areas of internal peripheries and close to the southern border stagnated beside an intermediate stage. Only the small region of Lenti seemed to be falling behind. The reason of the leading role of the county seats in the economic structure change was clearly the higher education and qualification level of human resources above the average, the stable and relative big labour market as well as the advantageous infrastructure of the region.

West Pannonia has an extremely advantageous geographic situation as well as a balanced economic structure (43 % industry, 53 % service). The rate of foreign capital in the region is high, according to the GDP, it takes the second place among the regions after the Region of Central Hungary; the value of the GDP is by 33 % above the national average of the counties. Considering the labour market, it is important to stress that 8 % of the workers work in a micro-undertaking, 16,2 % of them in a small-undertaking, 23,8 % of them in a medium sized enterprise, while 51,9 % in a big enterprise. The share of big enterprises from the GDP is 74,6 %, while their share form the export is 87,9 %.

The industrial production has tripled since 1991. Industrial branches that based on cheap labour force (light industry, machine industry with low added value) left the region, and a change of the economic structure towards industrial sectors with higher added value is going on. The strongest industrial branch in County Győr-Moson-Sopron is the motor car production and the engineering industry, while in County Vas the manufacture of machinery. Concerning the food industry, meat industry, dairy industry and drink industry are important. In the chemical industry, the production based on the source of carbon dioxide in County Vas is significant.

In 2003, 57,7 % of the population of the age 15-74 was economically active in the region, while only 50,6 % of them was active in Hungary. The rate of the activity among the counties was the highest in County Vas (61,2 %) - this rate was the highest also in comparison with the
national rates - while it was the lowest (56.2 %) in County Zala. In the past years, the processes of the labour market took a negative direction: the number of employed decreased (from 436 thousand to 426 thousand people) while the number of unemployed increased over 20 thousand. The unemployment rate increased from 4 % to 4.6 % within a year. In fact, the staff work force reductions of multinational companies that settled into the region are the background of these negative processes because industrial branches that based on cheap labour force (light industry, machine industry with low added value) left the region and the economic structure's change towards the industrial sectors with higher added value is going on.

The rate of employment in agriculture is low, altogether 4 %. Concerning the conversion of timber, the branch of carpenter is powerful. In the region, there is 939 000 hectare cultivable land, more than half of it is arable land. The most frequent arable crops are wheat and maize. Sugar beet and spring barley are important in County Győr-Moson-Sopron because of the enterprises Sugar of Petőháza, Brewery Sopron and Distilling Factory in Győr. In County Vas and Zala fruit growing is important. In County Zala pear growing plays an important role. In the area of Sopron and Pannonhalma, there is an important wine-growing region. The area of the region is covered by 286 000 hectare forest which is in the property of the successors of the former state-owned companies. Live stock breeding is not characteristic. Only a few are occupied with cattle, hen and turkey breeding in the region which is owing to the processing plants.

Economic Performance

One of the (not very good and realistic, but) most often used method of measuring and monitoring economic activities is study of the total amount and per capita value of the gross domestic product (GDP). This index has to be dealt with cautiously, as it is not sure if it takes into account several factors, namely damages caused by production technologies, the increasing costs for the society; it is not sure that it gives a realistic picture of the given area, when it is increasing, but the real income of the population does not increase in the same pace, the living standard does not increase or profits are not invested at the place of production.

In 2003 GDP of West Transdanubia on actual prices exceeded 1,700 billion HUF, which was the highest figure in the country, apart from Central Hungary with the capital. Compared to 1994 this means that GDP increased by for times, similarly to Central Hungary and the Central Transdanubian region; dynamics of this process was 30% higher than growth of the nationwide average.

The West Transdanubian region participated from the country’s GDP in the period from the system change by 10.5% on average, along with an increasing tendency. As regards the per capita GDP value, which was 1.7 Million HUF in 2003, the region’s value exceeded the nationwide average in each year.

Dynamic transformation of the economic structure was not even within the region and further increase in the yet existing territorial differences can be observed (between the more
developed Győr-Moson-Sopron and the less developed Zala). The economic distribution is even more heterogeneous on the level of the small regions.

Relatively big territorial differences can be observed in the county even if we examine competitiveness of the particular small regions. The closer attraction zone of the county towns, Sárvár, Szentgotthárd based on the economic openness, availability of global networks and clearway networks, capacity of the innovation centres as well as presence of human resource and the information and communication technologies, and based on its touristic features the Keszthely-Hévíz small region can be regarded as absolutely or relatively competitive small regions. In the contrary, regrettably many completely uncompetitive small regions are also to be found in the region, mainly along the southern border as well as in the internal periphery of Vas and Zala.

Sectors

Looking at the sectoral features it is worth to be emphasized for the agriculture, that in spite of the structural changes the collective companies remained the most important units with the highest number of employees. At the same time, individual enterprises outnumber the collective ones, primarily because the former employees, after losing their working place, were seeking their living in one-man enterprises - due to their special expertise, education and close rural affections. In the last period forming of cooperation between producers, purchasing and sales cooperatives was starting.

Basis for the plough-land cultivation of plants is represented by the cereals, first of which in terms of the sowing area is wheat, then comes with slightly less sowing area corn and that of barley is by far the least among the three. Plants characteristic to the region - especially to the northern and central parts of it - are sugar beet and spring barley, thanks to the presence of processing industry (Sugar Factory of Petőháza, Brewery of Sopron, and Distilling Industry of Győr). Role of the vegetable planting is only significant in some regions of special production capabilities (e.g. cucumber, roots). Grass farming and fruit planting are significant in the Hegyhát in Vas and in the Zala Hills. The biggest contiguous pear plantation in the country can be found in county Zala, where apple conquers ever growing areas. Sales and profitability problem is caused by the decrease of capacity of fruit processing plants and cold storage. Sopron, Pannonhalma and the Balaton area are famous wine-growing areas and wines produced have an ever growing acknowledgement. Among the economic sectors carrying out production activity, role of the industry, more specifically the processing industry is prominent.

Economic Organizations

Number of enterprises registered in West Transdanubia was approximately 117 thousand at the end of 2004, which is a value 12.4% higher than that in 2000 and it exceeds the value of 8 years ago by 21.6%. Number of enterprises per 1000 inhabitants is 117 (it was only 83 in 2000), much higher than the nationwide average, moreover, it exceeds the same index for all regions except Budapest. 80% of the registered enterprises are operating, a ratio also higher
than the nationwide figure. Choice of the enterprise form is generally closely related to the amount of capital available for the given enterprise, its activity, and its opportunities. Ratio of individual enterprises among the operating ones is 61% in the region, a figure slightly higher than the nationwide average.

It is observable that in small regions less developed economically, private initiatives and individual enterprises are much more vivid, than in the county towns. This difference can be as high as 10 or 15 per cent. So among the operating enterprises there are 32 thousand collective ones. This figure doubled in the last 10 years, which also points to a strong entrepreneur background. Among the operating enterprises there are 129 big companies with more than 250 employees, while the number of medium-size companies with 50-350 employees is 500, i.e. 98% of the enterprises are micro or small enterprise having less than 50 employees.

Territorial concentration of the economy is suggested by the fact that nearly half of the operating companies work in the county towns (Győr, Szombathely, Zalaegerszeg) or the attached small region (moreover, one fourth of them are to be found in Győr or its close attraction zone), and if we add the small regions of Sopron, Nagykanizsa, Mosonmagyaróvár and Keszthely, the ratio amounts to as much as 80%. Reason of their concentration is unambiguously the fact that the existing infrastructure, the presence of local trained workforce, as well as closeness of the potential market helped in settling and later in operating the industrial or construction enterprises, but the same factors also direct enterprises in the service sector towards the county towns or the middle sized towns.

Foreign Working Capital

Working capital has played a decisive role in the privatization and company building processes. Global companies became determinant players for the development and the transformation of structure of economy, by implementing up-to-date manufacturing technologies and, at places, by their innovative behaviour. Number of companies possessing foreign capital continued to increase until the end of the 90’s in the whole region, and in 1998-1999 this trend stopped. Number of foreign enterprises is stagnating around 700 since then and it decreased significantly in Zala working almost 700 in 2004, while in Győr-Moson-Sopron their number is slightly decreased and it is stagnating around 1150 in the last years. This means that a slight decrease can be experienced on a regional level in the last few years, the figure is around 2500 in 2003-2004.

Following the Central Hungary region – which also comprises the capital – the West Transdanubian region was able to attract the highest amount of foreign working capital. Based on the own capital of the enterprises, Győr-Moson-Sopron is the second in the ranking after the leading Pest county, while Vas is the tenth and Zala only the 17th. These differences can be explained by the territorial unevenness of the investments of the multinational companies and the differences in the infrastructure. Aims of some of the foreign investors were motivated by short term interests (e.g. acquiring new markets, cheap and trained labour),
while other were governed by long-term strategic aspects. These factors together influenced distribution of the foreign enterprises among the different economic sectors.

Decisive majority of the own capital (93%) is concentrated in enterprises carrying on industrial activity. Within the industry, most of the capital investment is directed towards the machine industry and in some of its sectors – mainly in the office and computer production, in the field of communication, the manufacture of public road vehicles – many global firms established extremely up-to-date factories. The amount of foreign capital invested in real estate businesses and economic services is also significant. As a result of dominancy of the shopping centres with headquarters in the capital and with a countrywide network, the presence of foreign capital in trade is not significant (1%) on a regional level. Banning of foreign citizens from acquiring a land property, and the lower capital and investment demand and not so well computable profitability of the sector contributed to the fact that only 0.7% of the international capital present in the region is interested in agricultural activities.

Employment

While number of employees continuously increased and the unemployment rate continuously decreased in the 90’s with the increase of the activity rate, in the last years rise of the number of employed people stopped and shows a slight decline. The state of employment - despite the negative processes of the last years - is still much better in the West Transdanubian region than in most regions of Hungary (it is slightly better than here only in Budapest).

Some characteristic data of the workforce market

<table>
<thead>
<tr>
<th></th>
<th>Western Transdanubia</th>
<th>GYMS 2004</th>
<th>Vas 2004</th>
<th>Zala 2004</th>
<th>Hungary 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1996</td>
<td>2000</td>
<td>2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity rate, %</td>
<td>60.2</td>
<td>58.7</td>
<td>57.2</td>
<td>55.2</td>
<td>59.7</td>
</tr>
<tr>
<td>Unemployment rate, %</td>
<td>6.6</td>
<td>4.2</td>
<td>4.6</td>
<td>3.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Employment rate by sectors, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>8.6</td>
<td>5.7</td>
<td>4.0</td>
<td>4.3</td>
<td>4.1</td>
</tr>
<tr>
<td>Industry</td>
<td>39.8</td>
<td>42.3</td>
<td>39.4</td>
<td>38.4</td>
<td>43.2</td>
</tr>
<tr>
<td>Detailed: Processing industry</td>
<td>36.3</td>
<td>40.2</td>
<td>37.3</td>
<td>36.1</td>
<td>41.7</td>
</tr>
<tr>
<td>Construction Industry</td>
<td>4.3</td>
<td>4.5</td>
<td>4.4</td>
<td>4.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Service sector</td>
<td>47.3</td>
<td>47.5</td>
<td>52.2</td>
<td>53.0</td>
<td>48.9</td>
</tr>
</tbody>
</table>

Source: Grosz(2008) compilation based on KSH data
Activity rate exceeds the Hungarian average by 3.5 per cent, it was 57.2% in 2004, which, however, is lower by 3.5 per cent than the same figure in 1996. There are differences between the particular counties in this respect, too. Activity is the highest in Vas, where it is still 60% despite the slight decrease in the last years, while the economic activity is around 58% in Zala since almost 10 years. In contrary to this, the 60% rate in the mid-90’s showed a continuous decrease and was only 55% by 2004 – the lowest value in the region.

Number of employees continued to decrease from the mid-90’s, though extent of the reduction is very slight, it’s only 1.5%, it decreased from the then 431 thousand persons to 427 thousand by 2000, and to 424.6 thousand by 2004. Much higher is, at the same time, the reduction in the number of active workforce, which is as high as 3.5%. On the contrary, unemployment rate (number of unemployed) showed a dynamic decrease until 2002. This figure was as high as almost 50 thousand in the few years after the change in the political system, and there were only 26 thousand unemployed by 1998 and 18 thousand by 2002 in the three counties. From 2002 the number of unemployed rose again above 20 thousand, due to the unfavourable conditions on the labour market and this tendency is perceivable primarily in Vas and Zala counties. This meant a rapid fall of the starting figure of 9% in the early 90’s to 4% and this rose again to 4.6% in the last years (this figure is still the second best in the country after that of Central Hungary and much lower than the Hungarian average).

Background of the negative processes is primarily the staff reductions carried out by the multinational companies settled in the region. In the industry workplaces were ceased mainly in the food industry and textile industry. Ratio of blue collar workers, the men, the unqualified and the first carrier starters among the unemployed is lower than the Hungarian figure.

Processes that radically transformed the employment structure in first half of the 90’s are still working today, with a moderate intensity. Share of agriculture within the employment significantly decreased due to various factors: division of the land property into smaller plots as a result of concentration of land usage and development of planting technologies; dismembering of the large plants, the market crises. In 1996 it amounted only to 8.6%, while today it’s only 4%, a value only slightly higher than the Hungarian average. In Győr-Moson-Sopron role of agriculture in the employment is relatively higher in spite of the strong industry, while in Zala (with its unfavourable natural conditions) it is lower then the EU average. It is quite apparent that role of agriculture in employment is often high in less urbanized small regions it exceeds the 6-7% values, while in the county towns and their vicinities it is well below the regional average. It is lowest in the Győr small region and highest in the Csorna small region.

Proportion of the employees in the industry is permanently 40% in the region, which figure is good enough for the region to be the most industrialized regions of the county (together with Central Transdanubia), this figure exceeds the Hungarian average by 10 per cent. Further 4.5% is the share of construction industry. Following the change in the political system, role of industry played in the employment did not fall together with the national tendency, as sectors affected most by the economic crisis (i.e. mining, the former heavy industry) were not
represented on a significant proportion in this region. In addition, investments of companies in the processing industry, that have international shares or also work with domestic capital created new workplaces. After the slight increase in the 90’s today a reduction in the industrial employment rate is characteristic feature of the region. By 2004, number of industrial employees fell by 10 thousand people in four years, which was still 119 thousand persons.

Role of the tertiary sector in the employment rate exceeded already in 2004 the 52% figure. In spite of the fact that these values are still lower by 10 per cent than the Hungarian average, the value in itself still points to a developed nature of the service sector, as this growth could be achieves along with a significant industrial concentration. Within the tertiary sector, the biggest employer is the public administration, the education and the healthcare system, with a total of around 67 thousand employees, but also significant are shares of trade and transport and storage, with around 28 and 26 thousand employees, respectively. Roles of the financial sector and that of special services in employment are still very small. A further emphasis on the tertiary sector is prospected very likely, especially in the field outside the budgetary sector, like tourism (accommodation, lodging), trade and economic, business services. While increased workforce demand of these sectors is a tendency going together with the socio-economic evolution, weight of agriculture – or that of industry to a much higher extent – is prospected to be reduced further.
Trade and finance

An unequivocal basis for the dynamic growth of industry is a strong export orientation, which characterize not only foreign companies settled down in the region, but partly the domestic firms as well. Regrettably, part of the foreign investments (e.g. electronics industry) is characterized by implementing activities with lower added value (e.g. assembling), and were not able to integrate into the county’s economy by building domestic supplier chains.

Signs were seen in the mid-90’s that sustainability of that growth dynamics would be jeopardized. Resources for a policy concentrating to attraction of and settling new companies (mainly big enterprises) (e.g. cheap and trained labour, manufacturing cost-advantages, financial subsidies, tax preferences, etc.) will be gradually exhausted.

Majority of the existing export-oriented sectors are of high import demand, at the same time they are characterized by relatively low added value, uncomplicated assembling requiring mainly unqualified workforce and hired work. In the early 2000 years even these activities with less added value – primarily in the textile industry and the electronics industry - a withdrawal of capital, which can cause in some regions major employment problems.

Tourism plays an important role in the economy of the region. Besides the geographical situation of the area, it is due to the fact that the region has rich and various tourist attractions.

From the most important fields of tourism health tourism has to be stressed. The bath culture of the region can be traced back to the late period of the Roman Empire, more towns of today, among others Szombathely (Savaria) and Sopron (Scarbantia) preserve remains from the Roman period. Because of the geological features, the region is rich in thermal and medicinal springs and can be proud of more thermal baths as well as of a steadily increasing medicinal and wellness offer.
Infrastructure

North-South Traffic Axis

Traffic situation of the West Transdanubian region is basically determined by its location along the border with four other countries (Slovak, Austrian, Slovene, and Croatian border sections) and its structure of settlements. This region is the Western gate of Hungary as the most important traffic lines on the road, on railway and on water are entering the country here and pass through its territory (60% of the Hungarian road traffic, mainly trucks, leaves the county through this region).

The region is also touched by three Helsinki traffic passages, the first is the passage number IV: Pan-European traffic passage, which connects Western part of Europe with the Balkan, the other is number VII representing the river Danube, while the third is the number V Pan-European traffic passage, or better one of its branches, the number V/B passage. Part of the number IV passage are the M1 and M15 expressways and the Budapest-Hegyeshalom railway line, while to number V belong the future M7 motorway which connects to Croatia at the Letenye border-crossing and the M70 expressway which connects to Slovenia at the Tornyiszentmiklós border-crossing. Railway branch of the same traffic passage is the Boba - Zalaegerszeg - Bajânsenye-country border (Hodos) line.

These traffic passages do not serve the traffic flow in the North-South direction, which is dynamically growing. A marked traffic passage with a North-South traceis missing in the West Transdanubian region, the M9 and M86 expressways and a quality railway line that would serve internal cohesion of the region, as well as connect the above described Pan-European passages and would be of paramount significance in the Baltic – Adriatic relation, while it would connect the above described Pan-European passages at the same time.

The region is involved at present in several international trunk networks of railway lines, which connect the capital and the neighbouring countries across the border stations of Hegyeshalom, Rajka, Sopron, Szentgotthárd, Bajânsenye, and Murakeresztúr. In the North-South railway connection a major role is played by the Győr – Celldömölk - Szombathely, Sopron-Szombathely, and Szombathely-Nagykanizsa railway lines. There are two railway companies present in the region: MÁV and GYSEV. Major railway hubs: Győr, Csorna, Szombathely, Celldömölk, Pompác, Zalabér-Batyk, Zalaszentiván, Zalaegerszeg, Zalalóvő and Nagykaniszsa.

There are two significant airports of regional roles in the region. One is the Sármellék airport near lake Balaton, the other is the airport of Péter near Győr. Further airport mainly for sporting activities can be found in the region, including those at Fertőszentmiklós, Szombathely, Zalaegerszeg (Adráshida), Nagykaniszsa (Bajcsa), or Zalakaros. The latter four airports are merely grassy landing fields and do not qualify for public take-off and landing fields.
There is only one navigable water passage in the region: the river Danube, which represents the number VII Helsinki passage. Important rivers from the aquatic tourism aspect are: Rába, Mosoni-Dona, Mura, and Zala. The region is also involved in the shipping on the lake Balaton through the ports of Keszthely and Balatongyörök. The only developed and constantly working trade port is that of Győr-Gönyű with a national public transport place. It is presently a RO-RO type loading place (loading of heavy lorries) and quay, so far only with road-river connection.

Although public transportation supply in the region can be regarded grossly good, a significant social issue is posed by providing the small villages with a dead-end access route with the necessary goods – a minor trade volume. This also influences supply quality of the public services (education, healthcare, social care), thereby affecting retaining power of these regions. The most characteristic feature in the vicinity of major towns is commuting to the suburbs.

Characteristic of the railway network is that it is radially designed in the vicinity of major towns and transfers towards the capital or international directions can be realized through these towns. In this respect prominent towns are Győr, Sopron and Szombathely.

In February 2006, the Regional Transport Association was founded, in the cooperation of six towns, six transportation service providers, and the relevant Ministry, as well as the Regional Development Agency of West Transdanubia. This local initiative was created by holding the Budapest Transport Association in mind as a model with the aim of enhancing quality of the public transportation and/or improving the accessibilities, and to contribute to environmentally friendly way of transportation via the better service of passengers.
Strategy for development

Goals of the Region

West Transdanubia is the region of lively local and international cooperation networks which, as a participant in the traffic of dynamic European transportation and economic axes and implementing a development policy built on a balanced relationship between people and the environment, wants to become the green region of Hungary, which is renewed both economically and culturally.

To achieve these goals it is necessary:

1. to create an economy which is based on innovation as well as on local and international cooperation networks and widespread circulation of the application of information technologies,
2. to develop the tourism based on high-quality medical, health protecting and wellness services and/or the regional cooperation with sustainable utilization of natural resources and the cultural traditions with touristic aims,
3. to improve the settlement and environmental conditions, which determine living standards of the local community,
4. to create public services built on demands of the community and the settlement structure, to renew the relationships among settlements.

For every development the following factors should be taken into account: environmental awareness; sustainability; increase of employment, equal opportunities, as well as spreading of info-communication technologies.

The West Pannon Regional Development Council founded the West Pannon Regional Development Agency as one-person owner, that performs the management tasks of the Council and further, it plays an active role in the professional relations within and across the region, in the development of the economy and in the encouragement of local initiatives.

In December 2004, the Council introduced a new network operating model. Instead of the committee system, characteristic of the former structures, it now has only one permanent coordination committee. In addition, the Council—on the basis of various agreements—cooperates with regional authorities, organisations and committees working in certain professional fields (Environmental Protection, Higher Education, Training, Tourism, Health, Sports, Civil Issues, Marketing, Innovation). These help the Council derive expert opinions for decision making purposes.

Regional Development Agency

The West Pannon Regional Development Agency (RDA) was founded as a 100% subsidiary of the West Pannon Regional Development Council (RDC).
The RDA’s main tasks are to support the work of the RDC and to implement the specific objectives set in the West Pannon Regional Development Programme. The Agency participates in establishing a future vision for West Pannonia, and is responsible for implementing the regional development programme.

It carries out tasks associated with the working body of the Regional Development Council, helps and promotes the flow of regional development information in the region, supports local and small regional initiatives, and organises as well as coordinates conferences, meetings, and training programmes.

The Agency does not operate as an agency in the literal sense of the word. The Agency takes part in the comprehensive, all-inclusive management of the respective projects. This includes all aspects from the establishment of the planning programme, to the monitoring of activities. Based upon the knowledge of the given situation and its own resources, the Agency decides whether to pursue direct involvement, to take up a coordinating role, or to apply a mixed approach. In the course of its activity, the Agency has established a wide level of cooperation with regional, national, and international organisations.

West Transdanubia took the lead in utilising the innovative methods of developing the economy. Three regional organisations (the West Pannon Regional Development Council, the Regional Tourism Committee, and the West Pannon Regional Development Co.) created the Pannon Business Initiative in October 2001.

It aims to support the economic development of the region by encouraging investments, developing the small, and medium-size enterprises, organising events and regional forums, introducing innovative methods and other active operations. It operates within the framework of the Regional Development Agency. The Initiative was meant to serve as an example for a well-organised, harmonised, regionally integrated economic development model, and thus facilitate the general increase in the competitiveness of the entire region in the long run. The cooperative network of the Initiative can in fact be considered a loose voluntary cluster of the numerous organisations engaged in economic development (Pannon Business Initiative 2006).

Regional Innovation Agency

The National Office for Technology and Research (NOTR) supports the innovation-based improvement of the economy, the competitiveness of the Hungarian regions, the formation and strengthening of regional innovation networks, and the decentralisation of the regional innovation incentive schemes. It has thus supported the establishment of regional innovation agencies. The Pannon Novum West Pannon Regional Innovation Agency was established by the region’s innovation actors with the support of NOTR in 2005. The main task of the Agency is to implement the regional innovation strategy that was prepared in 2001 for West Transdanubia, namely to harmonize innovation processes, to encourage the spreading of knowledge, to provide and integrate innovation services, and to establish and strengthen the requisite technological innovation networks. By enhancing innovation activity, it contributes
to the competitiveness of micro-, small and medium enterprises. The Agency helps to develop a more innovative environment, encourages networks, and develops new innovation services by implementing strategic objectives and activities.

The Agency now operates as a consortium of different regional and national organisations representing the regional target groups.

The three years funding period of the project ended in 2007, but both the national and regional policy makers are interested in continuing the operation in the future. 2008 starts another three years funding period of NOTR.

In 2005, a new body focusing on innovation policy was established: the West Pannon Regional Innovation Council. The members of the Council represent different organisations, thus a great number of regional actors are connected to the work of the Council. Task is to facilitate innovation processes, to provide professional proposals, to provide decision support for the Regional Development Council, and to control and coordinate the work of the Regional Innovation Agency.

**Pannon Business Network**

In 2006, the Pannon Business Network was established by six cluster organisations, and after its establishment, the 23 industrial parks in the region joined the Network. Furthermore, the West Pannon Regional Development Co. (a financing institution), the regional representation of the MTESZ (a professional association), and TISZK (an integrated agent for vocational training) are all among the founders. The Network’s mission is to contribute to the improvement of labour force quality and the competitiveness of regional enterprises. It aims to integrate all company groups representing the region, so as to establish a network which is efficient and representative of the regional sectors, the regional distribution of firms, and the regional company size. The industrial parks are able to represent the most important multinational companies in the region (Pannon Business Network 2006).

**Regional RTD Policy, Priorities, and Measures**

The economic development of the last 15 years was mainly based on factors such as low wages (but relatively skilled workforce), well developed infrastructure, tax allowances and incentives, and geographical location, closeness to the Austrian border and the Western markets. One could characterise it as a form of extensive development that is based on labour intensive inputs with a low technological base, although there are some foreign multinational companies with the highest technology and some very competitive Hungarian SMEs with state-of-the-art technologies and products (ROP 2007). Nevertheless, there is a need to transform this extensive development process into an intensive one which is based on knowledge, innovation, and R&D activities.

The most important problems are follows:

- A low level of R&D spending, only about 0.3% of GDP;
- A low level of cooperation between the business sphere and the academic sphere;
- A lack of academic and university research institutions (no traditional university);
- Highly centralised systems, no regional autonomy in innovation or R&D policy.

To cope with these problems, West Transdanubia has elaborated its own Regional Innovation Strategy (RIS) in 2001 (one among the first in Hungary) so as to accord to the regional development programme (RIS 2001). The mission of the RIS is the development of West Transdanubia’s innovation system. The main objectives here are:

- Creating the missing institutions in the regional innovation systems, reaffirming the existing institutions and organising them into a suitable network;
- Improving the innovation performance of enterprises with the help of specialised programmes and adequate application systems;
- Providing prominent support for those knowledge-based activities which produce high value.

Altogether, the RIS had eleven measures, and these were grouped into four priorities. However, all the regional actors knew that due to the highly centralised innovation and R&D policy system of Hungary, the region would not have the financial resources for its implementation. Any new initiative or project complying with RIS priorities in West Transdanubia had to be connected to the national policy schemes and programmes to receive financial support. The technology and knowledge-based development programme thus began. The first steps of this new development were the establishment of the regional cluster initiatives in five sectors and of some regional innovation centres in the most advanced industrialised centres such as Győr, Sopron, Szombathely, or Zalaegerszeg (Dőry / Grosz 2005).
The Priority Structure of the RIS for West Transdanubia

Priorities Measures

1. The improvement of the region’s innovation environment.
   1.1. Innovation award and premises marketing
   1.2. Promotion of best practice
   1.3. Interregional co-operation

2. The development of the knowledge base and the stimulation of knowledge diffusion.
   2.1. Support research and development, and innovation projects
   2.2. Promotion and support of innovation oriented trainings
   2.3. Innovation networks, clusters, and development cooperations

3. The development of the innovation infrastructure.
   3.1. Support the purchase of research and development instruments
   3.2. Innovation centres and research centre cooperation network
   3.3. Network development of innovation experts and consultants

4. Financing innovation.
   4.1. Foundation of the regional innovation funds
   4.2. Tender preferences

Source: RIS for West Transdanubia, 2001

In 2004, a technological foresight programme was prepared for West Transdanubia—again the first in Hungary—with the aims of establishing the continuous renewal of the industrial and economic structure of the region, creating the basis for greater value added in the economy and increasing the region’s competitiveness (TEP 2004). Four determining key branches were identified in the region:

- Mechanical engineering (esp. automotive, electronics and mechatronics),
- Tourism (esp. health tourism and rural tourism),
- Environmental industries (environment use, environmentally friendly resources and technologies, and renewable energies),
- Knowledge industry (from vocational training to higher education and research activities).
For these four key branches, special sectoral background materials were prepared which provide insight into the most important intervention points and the direction required at both regional and national level.

In the domain of cluster policy, West Transdanubia has also been a pioneer in Hungary. From 2000 to 2007, eight so-called cluster organisations (in most cases rather networks) were established in the region to support specific sectors. Two regional university knowledge centres and two cooperation research centres operating in the two university centres of the region, were established with national funding (Grosz 2006, Grosz 2007, Pannon Business Network 2006).

On the regional level, there are only two basic sources of funding for RTDI projects:
- contributions from the central government
- budget and 25% of the Research and Technological Innovation Fund to be spent on promoting RTD I activities at regional level

Fund to be spent on promoting RTD I activities at regional level. However, regions have just finalised their Regional Operative Programmes (ROP) for the period of 2007-2013, which is part of the second National Development Plan (its new name: New Hungary Plan). They are co-financed by EU and national sources. However, these ROPs’ do not contain any measure in the fields of innovation or R&D policy. These strategic fields will be dealt with in the next period in the Economic Development Operative Programme, which cover the whole country (ROP 2007, EDOP 2007).

Since 2005, 25% of the new Research and Technology Innovation Fund is allocated to the regional level, and regions may decide on spending priorities. However, the supporting contract is signed by the National Office for Research and Technology. This is the sole notable financial source for innovation at regional level (ca. € 4 million per year). The priorities of this Regional Innovation Development Programme package are established together with the Regional Innovation Agencies according to the RIS priorities and are formulated and approved jointly with the Regional Innovation Council.

The Programme supports region- specific measures with the aim of making R&D and innovation become the basis of economic development at regional level over the long run. In West Transdanubia in the last few years, the programme has focussed on the following priorities for innovation:

- The spread of new technologies and knowledge for innovation;
- Provision of special fellowship for researchers;
- Product, technology and service innovation, local development of new products and services;
- The foundation and establishment of new innovation-oriented services for stimulating clusterisation processes;
- Support for spin-off firms;
- R&D and innovation infrastructure development of innovation centres and firms;
- Improving the innovation culture via competitions, awards and public awareness campaigns.

R&D Expenditure

As last item in our study, now let us look at one of the most important indicators of the innovative activity, i.e. the R&D expenditure as well as the expenses and investments as a function of time. As regards expenditure related to R&D, the weight of the capital and county Pest is much higher even than the previous indices. Moreover, the decreasing tendency of the dominancy of Central Hungary seen in the last four to five years turned over by 2006 and its share from the total R&D expenditure of the country approached again the 70% value. If we look at R&D expenditure without R&D investments, the situation is slightly more favourable, however, in the field of R&D investment the concentration is even higher (more than 76%), the highest value of the last 6 years. Taken all these facts it is no wonder that share of some countryside regions from the R&D expenditure and investments is extremely low, which problem is increasingly perceptible in West Transdanubia, a region having otherwise insufficient R&D capacity.

In 2006 total R&D expenditure in the West Transdanubia region approached 9.5 billion HUF of which value (lower portion than the nationwide average) only 12.5% was spent to R&D investments and 8.2 billion HUF was spent on various expenses related to R&D activities. At the same time, regarding the last 10 years it can be established that - primarily due to an increased activity of companies in this field - ratio of R&D investments in total within the expenditures was the highest in West and Central Transdanubia with a value around 19-20%, while other regions of the country have a characteristic value of 16% or lower.

In spite of this, regarding both R&D expenditure and R&D investments the region can occupy only the fifth place in the ranking of Hungarian regions, a place from which it could not pass on since 2000, although the region has the highest growth rate in a 10 years’ perspective regarding both total R&D expenditure and R&D expenses. Reason of this is unequivocally the huge lag coming from the background, which is a previous concentrated institutional and infrastructural development policy so disadvantageous for the region. The results are similar if we look at the R&D expenditure in view of the population number. Regarding territorial distribution of the R&D expenditure within the region, the extent of concentration is possibly higher than in the case of other R&D indices. Per capita R&D expenditure in county Győr-Moson-Sopron is twice that of the sum for the other two counties.

In summary, we can establish that the weight of West Transdanubia region with regard to its R&D potential lags far behind its economical weight, notwithstanding its share from the countrywide population. In spite of the fact, that we can see extremely positive processes taking place in the region since the middle nineties, almost all indices of West Transdanubia show the most dynamic development in the last 10 years. Owing to primarily the very low basis value and other factors hindering improvement of the conditions (economic structure,
low level of business R&D activity, or lack of traditional university campuses, university research sites), the region still does not reach the countryside average of Hungary (without the capital; due to the high extent of territorial concentration, weight of Central Hungary is for most of the indices higher than 50%). Competitiveness and ability to get resources of the strong centres of higher education and research in Budapest and East Hungary of South Transdanubia is much better at present than the same parameters of their West Transdanubian counterparts. Therefore, with regard to these indices, the region’s ranking is not better in the majority of cases than 5 or 6 among the Hungarian regions and one cannot expect a significant progress in the near future, either.

The issue is even more serious if we look at innovative activities of the region in European dimensions. This is based on the most recent results of EIS (European Innovation Scoreboard 200), though situation of West Transdanubia does not seem to be so disadvantageous compared to other regions of the country, since its 0.25 value is not very much different from that of the other regions, except for Central Hungary and Central Transdanubia. Nevertheless, the handicap is huge, if we compare this figure to the EU average (EU25: 0.45, EU15: 0.5), or even compared to the nearby regions (Slovenia: 0.52, Steiner: 0.56, Bratislava: 0.66). The value for West Transdanubia is the 176th on list comprising 203 regions, which ranking - to be honest - is not the cause for very much pride for us.

Good indication of the lack of ability of the region to acquire resources is that it could get only 7% of the governmental developmental resources in 2005, while its share in the population is 9.8% (VÁTI-ÖTM 2007). This was especially true for the resources supporting economic growth: as low as 3% of the total resources to be spent for this objective in the county; the per capita support is lower the one-third of the county average.

Level of subsidization of the particular fields of development was extremely unbalanced even within that low amount. In the West Transdanubia region, by far the highest portion of the total amount of subsidies given for development of the economy, i.e. 67% (1.5 billion HUF) was used for innovation or research, which is a fact due to the prominent amount taken by the regional knowledge centres. On a nationwide comparison - due primarily to the low number of research institutions of national significance -, however, the situation is not so favourable, since only 5% of the research-oriented support awarded in the country was received by this region, so the per capita research support is only half of the country average (VÁTI-ÖTM 2007). Within the region, majority of the subsidy went into the small regions primarily accommodating the university cities (small regions of Győr, Sopron, Mosonmagyaróvár, Keszthely, and to a lesser extent Szombathely) and only minimal amounts of agricultural innovative or research subsidies could be absorbed by other small regions.
### Subsidies utilized in the region, with the aim of economic development, 2005

<table>
<thead>
<tr>
<th></th>
<th>Enterprise development</th>
<th>Innovation, research and development</th>
<th>Business development of infra-structure</th>
<th>Tourism</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total awarded subsidy, thousand HUF</td>
<td>18 390</td>
<td>1 479 286</td>
<td>344 145</td>
<td>364 086</td>
<td>2 205 907</td>
</tr>
<tr>
<td>% Share of the Region from the total amount</td>
<td>0.05</td>
<td>5.1</td>
<td>31.6</td>
<td>14.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Distribution of the subsidy among the particular objectives, %</td>
<td>0.8</td>
<td>67.1</td>
<td>15.6</td>
<td>16.5</td>
<td>100</td>
</tr>
<tr>
<td>Per capita subsidy, HUF</td>
<td>18</td>
<td>1 476</td>
<td>343</td>
<td>363</td>
<td>2200</td>
</tr>
<tr>
<td>Nationwide average of per capita subsidy, HUF</td>
<td>3 553</td>
<td>2 851</td>
<td>112</td>
<td>249</td>
<td>6 765</td>
</tr>
</tbody>
</table>

*Source: VATI-ÖTM, 2007.*

In summary, we can state that the deficiencies experienced in the R&D and innovative potential by the West Transdanubia region can jeopardize sustainability of the economic growth of the region even on the middle term, therefore solving this controversy should be a main priority.
II.2.2 SWOT analysis of the region

Strengths and weaknesses concerning:

- Resources
- Policies
- Infrastructures
- Programmes
- Main actors’ contribution such as business parks, incubators,

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEEKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Exceptionally good geographical environment (European transport axises, natural waterways, region bordering 4 countries)</td>
<td>• Lack of transport network components that service internal cohesion and external relations and ensures swift accessibility: Northern South (M9 and M86) and East Western (M8, M85) axises as well as cross-border intertownship roads ensuring direct connection with neighbouring countries. Out of date transport infrastructure (road networks, railways and waterways, river- and air docks, vehicle parks).</td>
</tr>
<tr>
<td>• Wide range of natural, cultural and built heritage, favourable tourist facilities (rural tourism in particular by utilizing thermal water).</td>
<td>• GDP per capita is low in comparison with the EU average, significant regional differences along the Northern South borderline.</td>
</tr>
<tr>
<td>• Low unemployment rate on a regional level.</td>
<td>• Significant and increasing internal inequality in the region, unemployment is concentrated in the internal peripheral townships, strong regional differences in earnings and earning opportunities; low level of mobility (commuting issues, housing situation).</td>
</tr>
<tr>
<td>• Tradition of co-operative systems, open-minded thinking (e.g. functioning labour market pacts; clusters; town network, local collaborations, active civil network, wide range of cross-border and international co-operations).</td>
<td>• Weak relationship amongst foreign and home sectors: areas with significant economic differences within the region which at the same time resulted in differing interests.</td>
</tr>
<tr>
<td></td>
<td>• Vulnerability due to the mobility of</td>
</tr>
</tbody>
</table>
Developed cross-border relations provide good opportunity to adopt European Best Practices.

<table>
<thead>
<tr>
<th>• Traditionally strong and large institutions of intermediate and higher education.</th>
<th>• Low standard of integration and economical orientation within the institutions of higher education (narrow range of network co-operations based on mutual benefits with real objective). • Significant differences regarding the opportunities for each institution due to their geographical location.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• According to the social television, there is a strong social institutional system in the constitutional towns (it is the most developed here). Joint social support.</td>
<td>• There is neither a medical university nor clinics as the head centre of progressive medical services or a transplant centre in the region. Bad physical conditions of the medical institutions.</td>
</tr>
<tr>
<td>• Intermediate and higher agricultural education, R &amp; D (Sopron, Keszthely, Mosonmagyaróvár)</td>
<td>• Deficiency within the areas of modern professional trainings and practices. • Low level of innovation activities in the region, in Vas and Zala County in particular; the R &amp; D capacity of the region is weak both from an international and a national aspect.</td>
</tr>
<tr>
<td>• Agricultural capital enterprises, concentrated production, high production technologies, low environmental strains, favourable conditions of production sites</td>
<td>• The direct effect of the economic processes on the decisive elements of the development of human resources is low – training supply, activities of qualifying institutions, training methodology, practice orientation etc.</td>
</tr>
<tr>
<td>• The region’s conditions are highly favourable for utilizing renewable energy.</td>
<td>• Migration of qualified workforce from the region.</td>
</tr>
<tr>
<td>• High degree of biological multifariousness, natural and near-natural scope and landscape structure, high forestation, rich wildlife.</td>
<td>• Lack of rational land, forest, wildlife and landscape management.</td>
</tr>
<tr>
<td>• Existence of a rich and good quality surface and ground water system and water wildlife.</td>
<td>• Sensitive catchment basins, high ratio of catchment areas, lack of a complex catchment protection system.</td>
</tr>
<tr>
<td>• The institutional grounds of the environmental education are established.</td>
<td>• Lack of institutional and personal preparedness for the environmentally friendly utilization of the dynamically...</td>
</tr>
<tr>
<td>increasing development resources</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>• Unique settlement network and special township structural notes. Rural areas with “little villages” providing quality residential areas. Strong town network consisting of the 5 county towns and midtowns.</td>
<td></td>
</tr>
<tr>
<td>• Favourable indicators regarding broadband internet connections amongst the population as well, good infrastructure for information technology in, major towns, the educational institutions are responsive to apply ICT.</td>
<td></td>
</tr>
<tr>
<td>• The electrical service developments are not fully comprehensive, as the issue of “the last mile” causes bigger issues regionally than nationally due to the rural areas’ “little-village” structure, the “non-users” fallback is increasing gradually, the lack of digital scribability affects the big part of the population, electronic sales are low.</td>
<td></td>
</tr>
<tr>
<td>• Regional organizations are highly receptive, open and have the ability to initiate innovative solutions.</td>
<td></td>
</tr>
<tr>
<td>• Scepticism against projects and proposals.</td>
<td></td>
</tr>
</tbody>
</table>
Opportunities and threats concerning:

- Legal and political factors
- Economy
- Technological progress
- Networking
- Social factors

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Favourable conditions for the utilization of exceptional geographical potentials (clearways and environmentally friendly distribution network, establishment of logistic centres, application of combined transportation).</td>
<td>• We are not making our region very appealing for those crossing our transit corridors (traffic jams – they are “passing by” without viewing our values or connecting to the economy of our region).</td>
</tr>
<tr>
<td>• Subsidy policy encouraging local collaborations (hereby efficient executive and administrative systems, reducing differences within the region, establishing quality workplaces).</td>
<td>• Efficient co-operative opportunities, heavily decreasing level of privity due to the lack of cross organisations. Weakening local co-operations due to the lack of or slow generation of common results.</td>
</tr>
<tr>
<td>• Strengthening cross-border cooperations (by the intersection of the 5 countries).</td>
<td>• Healthcare and social care systems are not able to correspond with the existing and changing future demand and the conditions of appropriate care.</td>
</tr>
<tr>
<td>• Strengthening role of the tourist sector (nationwide).</td>
<td>• The subsistence of the present social regulations may preserve the problems.</td>
</tr>
<tr>
<td>• Real opportunities with regards to R &amp; D and innovation.</td>
<td>• For-profit organizations (regarding public utilities) do not necessarily comply with the demand of the most in need.</td>
</tr>
<tr>
<td>• Realisation of the conditions for the</td>
<td>• The trained workforce is not suitable for the development of the region.</td>
</tr>
<tr>
<td>Increasing regional institutional capacity (both regionally and township-wise).</td>
<td>• Good opportunities for the qualifying institutions to be developed to a network (Regional Integrated Qualifying Institutions network, network of institutions for adult training, network of institutions for higher education, R &amp; D institutions network).</td>
</tr>
<tr>
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</tr>
<tr>
<td>• Regional Labour Market Pact which may influence the co-operation amongst the qualifying institutions, adult training and higher education as well as the institutions for R &amp; D.</td>
<td>• In the spirit of “forever learning strategy” the training, adult training and higher education can be integrated to a network-based regional system.</td>
</tr>
<tr>
<td>• Extensive application of alternative, maintainable environmental technologies in the EU.</td>
<td>• Increasing demand to establish maintainable, ecological area utilization and landscape management; increasing demand for the preservation of biological multifariousness, near-natural scope and landscape structure.</td>
</tr>
<tr>
<td>• Horizontal validation of environmental interests from an ecological aspect, in the course of economic, area, rural and tourism development in particular.</td>
<td>• Legal requirements for the establishment of tuned water management system taking ecological aspects into consideration as well.</td>
</tr>
<tr>
<td>• Partnership-based shared tasks and</td>
<td></td>
</tr>
<tr>
<td>Responsibilities to improve environmental and natural conditions in the region, ensuring publicity and social partnership.</td>
<td>Economic development causing increasing environmental risks and losing the possibility of maintainable development.</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Possibilities of ensuring continuous monitoring by establishing an information system based on the demand in the labour market in the wake of changes in training, adult training and higher education as well as the changes in research and development.</strong></td>
<td><strong>Sources for rural development are not available continuously, there is not enough experience for the secure operational criteria.</strong></td>
</tr>
<tr>
<td><strong>Civil services are determined to introduce electronic administration.</strong></td>
<td><strong>Procrastination results in a different, and new situation.</strong></td>
</tr>
<tr>
<td><strong>Progress in the areas of bio products and direct local product marketing.</strong></td>
<td><strong>Further concentration and industrialization of agricultural production.</strong></td>
</tr>
<tr>
<td><strong>Increasing attractiveness of rural habitat (not only as “a place to sleep”).</strong></td>
<td><strong>Worsening standard of living in the rural areas due to central decisions (regression of railways, closure of schools and post offices).</strong></td>
</tr>
<tr>
<td><strong>Efficient interregional co-operation in various areas of healthcare to recover professions with shortfall.</strong></td>
<td></td>
</tr>
</tbody>
</table>
III. Main actors contributing to the development of innovative capability and entrepreneurship of the region

III.1 The general situation of the business sector, mostly focusing to innovative entrepreneurship

- Presentation of the current situation of the business sector, which are the most innovative and promising sectors

Innovative activities of the enterprises operating in the West Transdanubian region have been surveyed in 2007 Spring, based on the Programme of the West Transdanubian Innovation Agency, by examining data obtained in the previous three years’ period. This survey performed with the involvement of about 401 companies can be divided into three parts: the first part refers to general enterprise-related information (e.g. their location, area of activity, size, annual revenues, and their territorial connections). The second part surveyed character of the companies’ activity with special attention to the four types of innovation that can be implemented by the enterprises – i.e. the product- or process-oriented, organizational and marketing kinds of innovation. Last but not least, implementation conditions of the innovation, development plans for the future, as well as innovative ability of the region were studied. Beyond this, we gathered information on the IT systems of the enterprises, the human resources available, and the patents, too.

On average, companies spent 3.44% of their revenues, but a maximum of 70% to R&D activities. Regrettably, 70.3% of the companies in the West Transdanubian region do not spend at all to R&D. R&D expenditure is 1 to 5 per cent of the revenues at 15.5% and more than 9.5% at only 11% of the enterprises. Over the same years, the countrywide average sum of the R&D expenditure was about 87 million HUF - a sum significantly biased by the huge R&D expenditure data of some big companies - such as the biggest amount, a 23 billion HUF sum. This bias can be eliminated by the most exact information provided by the calculated median, which amounts to 0 million HUF. If, however, we calculate the median only for those companies that had R&D expenditure, its value amounts to 16.5 million HUF.

More realistic picture can be obtained about the research activity if we look at the annually average value of the R&D expenditure: by this calculation we obtain an average R&D expenditure of 694 thousand HUF per employee and the maximum value was 25 million HUF per person. A picture closer to the truth can be obtained by using the median, which is 0 million HUF here as well, but also, if we only look at companies with non-zero R&D expenditure, this value is 470 thousand HUF. The proper number of well-educated workforce is an indispensable means for the innovative enterprises to operate effectively. Subject of our study in this case is the ratio of employees among the total number having higher degree qualifications. On average, 14.49% of the employees working at West Transdanubian companies have a higher degree qualification, but there are also companies in which each one of the employees have high-degree qualification. In the time period studied, companies of our representative sample employed an average of 3.32% of their employees in the R&D area.
### Raw R&D data of the companies participating in the survey, 2004-2006

| % | Total R&D expenditure as fraction of the annual revenues | | R&D expenditure as fraction of revenues | | Average of total R&D expenditure, million HUF | | Average total annual R&D expenditure per employee | | % of employees with academic qualification | | % of employees employed in R&D (average of years 2004 to 2006) |
|---|---|---|---|---|---|---|---|---|---|
| | | | - 0% | 70.3 | | - Average | 86.94 | | - Average | 14.49 |
| | | | - 1-5% | 15.1 | | - Medium | 0 | | - Medium | 10 |
| | | | - 6-10% | 4.7 | | - Maximum | 23000 | | - Maximum | 100 |
| | | | - 11+% | 9.5 | | | | | |

**Source:** Csižmadia - Grosz (2008)

37.9% of the West Transdanubian enterprises (152) have a own product manufactured in-house, a value less by 18.2% compared to the 56.0% figure found in our previous survey. As regards Quality Assurance issues, the situation is the same. 41.4% of the queried companies have some kind of quality assurance certification. As to the kind of QA certification applied by the enterprises, 26.7% is ISO 9001, 19.3% is HACCP, and 16.6% is ISO 9001:2000 - a distribution similar to that found in our study surveying the years 2003 to 2005.

Next we will examine weight in the field of certain studied activities of the various geographical regions - the parent county, other parts of the country, countries of the European Union, other European countries and other countries outside Europe. We can find a predominance of the parent county regarding both the purchases (44.4%) and the sales (52.1%). Other parts of the country have the second highest weight in purchases, which means averages of 23.3% in purchases and 17.1% in sales. In the years 2004 to
2006, the parent region is the third in purchases with 15.2% share, while its 13.5% share in sales is sufficient only to the fourth place.

Weight of different geographical regions in purchases

[Bar chart showing weight of different regions]

Source: Csizmadia - Grosz (2008)

Weight of different geographical regions in sales

[Bar chart showing weight of different regions]

Source: Csizmadia - Grosz (2008)

Low values for the parent region indicate weakness of the regional cohesion and those of economic relationships within the parent region, as well as point to an impracticability of the concept of planning-statistical regions. As regards purchases, EU countries have the
third place, while they are the third in the sales area. Purchases/sales share of other European countries and those outside Europe is vanishingly small.

In purchasing and sales activity of companies with an average annual revenue of less than 989 million HUF, the parent region as a territorial unit predominates. If we look at companies with above the average annual revenue, predominance of the parent county is also apparent with the difference of an weight increase of other parts of the country and Europe. The situation is similar if we do the comparison based on the annual statistical number of employees (i.e. size of the company).

Purchasing/sales area of the small and medium-sized companies (with less than 250 employees) is characteristically the parent county of the particular company. In case of the big companies (with more than 250 employees), majority of business partners come from the same county, too, but other parts of the country and Europe also come to the front. Finally, if companies are classified into two groups based on the average annual R&D expenditure, we obtain results similar to the previous one.

Innovations Implemented by Companies of the Region

From among companies of the West Transdanubian region, those at which any one of the four principal kinds of innovation - the product, process, organizational and marketing kind - occurred during the studied three years can be regarded as innovative. Hence, half of the West Transdanubian enterprises (50.1%) can be referred to as innovative ones. Proportion of the innovative enterprises in the total number is almost the same as the figure in our 2003-2005 study. Based on results of the Eurostat CIS4 survey conducted using the same parameters for the years 2002-2004, we can say that this proportion is on average 42% in the EU27 countries and exactly the half, i.e. 21% in Hungary (Fourth Community Innovation Survey 2007).

Occurrence of the four kinds of innovation, 2004-2006

![Graph showing occurrence of four kinds of innovation](Image)

Source: Csizmadia - Grosz (2008)
Average number of simultaneous occurrences of innovation kinds is 2. 38.8% of the innovative companies implemented only one kind, while 31.3% implemented two, 20.4% three, and 9.5% of them implemented four kinds of innovation. The case of at least three implemented innovation types we can speak about complex innovative activity - this kind of innovation was to be found in only 29.9% of the enterprises.

1. Product Innovation

‘Product innovation’ is meant to be marketing of a new product or service or marketing of a product or service significantly improved in some of its features. Innovation have to be new with respect to the enterprise itself, but not necessarily new in the industry or on the market. In the studied three years, 19.6% of the West Transdanubian enterprises introduced or developed new or significantly improved products and 7.2% of them services, i.e. the total number of companies carrying out product innovation was 89. Both are less than the same figures in our previous survey. From the companies carrying out product innovation, 88.8% developed products and 32.6% services.

Thus, we can speak about product innovation when product and/or service innovation occurred in the particular period, therefore some kind of product innovation can be found at 22.2% of the enterprises in our representative sample - a figure by 6.8% less than that for the companies in the period from 2003 to 2005.

From among the innovative companies performing product innovation, 78.7% implemented only one type, while 21.3% of them implemented both kinds of product innovation. These are typically innovations developed by the enterprises themselves or inside the particular group of companies - 85.4% of the enterprises implementing this kind of innovation. Regrettably, in this field only 14.6% of them cooperated with other enterprises, institutions or organizations.

Occurrence probabilities of the kinds of product innovation

<table>
<thead>
<tr>
<th></th>
<th>% of companies implementing marketing innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch of new products</td>
<td>88.8</td>
</tr>
<tr>
<td>Introduction of new services</td>
<td>32.6</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)

From 2004 to 2006, product innovation contributed to expansion of the product range and scope of the service to the greatest extent, which, in a three-level scale, meant a large contribution for enterprises implementing product innovation (and experiencing the particular effect).

The invention also resulted in significant improvement of the products and/or services: 42.7% of the companies marked the contribution as high and also 42.7% as medium. In the studied period, product innovation resulted in a medium contribution to their market share for 41.2% of the companies.
Evaluation of the effect of product innovation in % of the enterprises implementing them

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>No such effect observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater product or service range</td>
<td>48.3</td>
<td>36.8</td>
<td>13.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Increase of the companies’ market share</td>
<td>33.3</td>
<td>40.2</td>
<td>24.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Higher quality products or services</td>
<td>40.7</td>
<td>40.7</td>
<td>14.0</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)

The instances of product and/or service innovations were completely new for 62.8% of the West Transdanubian companies implementing product innovation, while they were new only for the particular company. Our research demonstrated that on average 25.36% of the total revenues in 2005 came from products introduced during the years 2004-2006. We also asked about the average time span between the idea of the new product and its launch to the market: this time is 7 months on average.

2. Process Innovation

Process innovation is meant to be introduction of a new or significantly improved technology, process, application, manufacturing procedure, marketing method or activity supporting the products or services. Just as for product innovation, the innovation should be new for the particular enterprise, irrespective of where it was developed.

Between 2004 and 2006, 24.9% of the West Transdanubian enterprises implemented some kind of process innovation - by 1.6% less than the same figure in our previous survey. When we narrow our scope and only look at the innovative companies, almost half of those companies carried out this kind of innovation.

Occurrence probabilities of the kinds of process innovation

<table>
<thead>
<tr>
<th></th>
<th>% of companies implementing marketing innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production methods</td>
<td>78.0</td>
</tr>
<tr>
<td>Methods in logistics, transport or distribution</td>
<td>33.0</td>
</tr>
<tr>
<td>Activities</td>
<td>52.0</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)

From the companies implementing process innovation, 54% implemented only one kind, while 29% implemented two, and 17% of them implemented three kinds of innovation. In the given period, 78% of the companies introduced new or significantly improved methods for the manufacture or preparation of their products or services. 52% of them applied new or significantly improved activities in the manufacturing process and there
were only 33% that introduced new or significantly improved methods in logistics, transport or marketing, related to the raw materials, products or services.

For 62.6% of the enterprises implementing process innovation, the innovation was carried out within the company or group of companies and 37.4% carried out the development in cooperation with other companies, institutions or organizations. This portion is significantly higher than that we saw for product innovation.

Effects of the process innovation were likewise examined at a three-level scale; it can be stated that its largest contribution is in the flexibility of production or service, which parameter, however, is rendered by most enterprises (45.8%) medium quality and meant a major effect only for 34.4% of them. Innovation resulted in major effects in the utilization of productive or service capacities for 22.3% of the companies participating in the survey and a medium-sized effect for more than half of them, so this parameter (utilization) can be regarded the second most important factor. Our survey gives answer also to the question of how much process innovation promoted reduction of unit expenses related to materials and energy. This parameter caused a major reduction for only 11.5% of the enterprises, while for 55.1% it had a medium effect. Process innovation, though at the least extent, also contributed to the unit wage expenses, resulting in a medium effect for 50% of the enterprises.

Effects of the process innovation on the enterprises implementing it

<table>
<thead>
<tr>
<th>Extent of the effect in % of enterprises</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>No such effect observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility of the production or service</td>
<td>33.3</td>
<td>44.4</td>
<td>19.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Degree of utilization of the productive or service capacity</td>
<td>21.2</td>
<td>48.5</td>
<td>25.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Reduction in unit wage expense</td>
<td>5.1</td>
<td>35.4</td>
<td>30.3</td>
<td>29.3</td>
</tr>
<tr>
<td>Reduction in unit expenses related to materials and energy</td>
<td>9.1</td>
<td>43.4</td>
<td>26.3</td>
<td>21.2</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)
3. Organizational Innovation

20.9% of the enterprises participating in our survey implemented some kind of organizational innovation. If we only look at the innovative companies, this figure is 41.8%, a number almost 5% higher than the same figure in our previous study. Almost three-fourth (71.4%) of the enterprises working in the region implemented only one kind of organizational innovation, while 13.1% of them implemented two, and 15.1% three kinds.

In the observed three years majority of the enterprises (71.4%) introduces new or improved methods or procedures in the way they treated external relations (with enterprises and other institutions and organizations). 47.6% of them applied new or significantly improved methods or procedures related to work control and management systems; new or significantly improved methods or procedures in the workplace organization, the organizational structure and the decision-making procedures were applied by only quarter of them.

Occurrence probabilities of the kinds of organizational innovation

| Methods or procedures affecting the business practice, the work control, and the management system | 47.6 |
| Methods or procedures in the workplace organization, the organizational structure and the decision-making procedures | 25.0 |
| New methods and procedures in the ways external relations are treated | 71.4 |

Source: Csizmadia - Grosz (2008)

Organizational innovation contributed to making external relations more effective for 59.9% of the enterprises and only 3.6% of them experienced no results in this respect. Organizational innovation contributed to the effectiveness of work control to a high extent for 38.3% of them, while this contribution was medium for another 38.3%. Medium sized effect was experienced in the decision-making procedures for 53.3% of the enterprises, but there was a 8.3% for which no progress was experienced in this respect.

Effects of the organizational innovation on the enterprises implementing it

<table>
<thead>
<tr>
<th>Work control becoming more effective</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>No such effect observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of decision-making procedures</td>
<td>15.9</td>
<td>48.8</td>
<td>26.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Improvement of effectiveness of external relations</td>
<td>56.6</td>
<td>20.5</td>
<td>19.3</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)
4. Marketing Innovation

Marketing innovation means application of new or significantly improved marketing methods in order to increase sales, aiming at satisfaction of consumer demands, opening new markets, or placement with new purposes of products in the market. 32.4% of the West Transdanubian enterprises carried out marketing innovation, while the same portion is 64.7% if we look only at the innovative companies. From the enterprises participating in our survey, most (39.2%) implemented two kinds of innovation, while 28.5% of them only one. A complex marketing innovation (all 5 kinds) occurred in 9.2% of the enterprises. The highest number of marketing novelties occurred in the advertisement of products, 62.3% of the companies introduced marketing innovation in this respect. New or significantly improved marketing methods were applied by more than half of the innovative companies in marketing of their products, 45.4% in product design, 40% in packaging, and 30.8% in pricing.

Occurrence probabilities of the kinds of marketing innovation

<table>
<thead>
<tr>
<th>% of enterprises implementing marketing innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product design</td>
</tr>
<tr>
<td>Packaging</td>
</tr>
<tr>
<td>Marketing</td>
</tr>
<tr>
<td>Advertising</td>
</tr>
<tr>
<td>Pricing</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)

Marketing innovations implemented by the companies contributed to better recognition of the consumer demands to the highest extent. On a three-level scale, this was marked by 47.4% of the companies as medium-sized and only by 20.7% as high. This kind of innovation contributed to an extension of their service range to medium extent for 43% of the companies, while for 6.2% of them it brought no such effect. Marketing innovation caused the least contribution to increase of the market share, resulting in a minor effect for 38.1% of the companies, on the three-level scale.

Effects of the marketing innovation on the enterprises implementing it

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>No such effect observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater product or service range</td>
<td>18.9</td>
<td>40.2</td>
<td>34.4</td>
<td>6.6</td>
</tr>
<tr>
<td>Increase of market share</td>
<td>17.2</td>
<td>42.6</td>
<td>36.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Better recognition of the consumer demands</td>
<td>19.5</td>
<td>44.7</td>
<td>30.1</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Source: Csizmadia - Grosz (2008)
Spin-offs and start-ups in the region- basic characteristics and overview

Between September, 2007 and January, 2008, a survey and a study were prepared by the colleagues of ERFARET entitled “Enterprises in the environment of the University of West Hungary”. It has the aim to identify the spin-off and start-up enterprises, to define their situation (how close is their activity to the UWH), to discover, who are establishing enterprises, what are the setback factors hindering the establishment of an enterprise and the potential possibilities at the university. In cooperation with the Laser Consult Ltd, a spin-off enterprise establishing and mentoring program model was prepared based on the allocation environment of the UWH. The results disclosed several problems:

- Uncleared status of the enterprises, consequently the mistrust and obscureness caused by the question of researchers’ incompatibility.
- Narrow financial background (there are no reserves at the universities to start risky enterprises, absence of business angel networks, economic condition, uncertainty of research enterprises).
- Competition for the subsistence of universities (fusion of institutions for higher education and faculties that induces continuous organizational and inner regulatory changes).
- The last years’ ever changing laws and the unfavourable tax policy for enterprises.

PhD and university students represent the highest potential because of their agility and independency.

A splendid example for this is Attila Tari who established his enterprise based on the design patent of a “computer-terminal chair” this year. In its start, ERFARET contributed as a mentor.
Comparison of innovative situation of the business sector of the region with the country

Hungary is a unitary and centralised country; the capital, Budapest, is the political, economic, educational, cultural and transport hub. It is composed of 19 counties, which have no decision-making power in the areas of education, R&D and innovation. Following EU guidelines the counties have been grouped into seven statistical/planning (NUTS 2) regions for administrative purposes. The regions are the recipients of EU Structural Funds, Cohesion Funds and other financing, but do not have local governments.

R&D activities

Despite its relatively small size, Hungary has a rather high level of regional disparity. Its less advanced regions failed to catch up during the first decade of the transformation, despite considerable progress in several respects, including modernisation of institutions, changes in regional policy, substantial spending on regional development, and accelerated economic growth. This is largely due to the spatial concentration of FDI which has tended to exacerbate regional differences.

Share of NUTS 2 regions in Hungary’s GDP, R&D and HRST, 2006
(Central Hungary=100)

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<tbody>
<tr>
<td></td>
<td>in PPP</td>
<td>Relative to Central Hungary</td>
<td>%</td>
</tr>
<tr>
<td>Central Hungary</td>
<td>101.6</td>
<td>100.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>61.1</td>
<td>60.2</td>
<td>0.2</td>
</tr>
<tr>
<td>West Transdanubia</td>
<td>66.8</td>
<td>65.8</td>
<td>0.2</td>
</tr>
<tr>
<td>South Transdanubia</td>
<td>45.6</td>
<td>44.9</td>
<td>0.1</td>
</tr>
<tr>
<td>North Hungary</td>
<td>42.5</td>
<td>41.8</td>
<td>0.1</td>
</tr>
<tr>
<td>North Great Plain</td>
<td>41.9</td>
<td>41.2</td>
<td>0.3</td>
</tr>
<tr>
<td>South Great Plain</td>
<td>44.2</td>
<td>43.5</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Source: NKTH (2009)

As a consequence, economic, social and R&D indicators show significant disparities across regions. Central Hungary, including the capital, plays a disproportionately large, even dominant political and economic role, accounting for a very high share of GDP, GERD and human resources for science and technology (HRST) GDP per capita and R&D intensity are about 1.5 times the national average. Some two-thirds of GERD and more than 70% of BERD
are spent in this region. With 59 higher education institutions (40% of Hungary’s HEIs), it also concentrates an exceptionally high share of university and college graduates. This concentration of HEIs and PROs does not always match the destination of FDI inflows, as there are some important strongholds (mainly in the automotive sector) in western Hungary. This situation has implications for policies to better embed foreign-owned enterprises in the regional innovation systems.

**Innovation activities**

Although it has a substantial share of high-technology industries, the Hungarian economy is characterised by low overall levels of business enterprise expenditure on R&D (BERD stood at 0.48% of GDP in 2006). Large enterprises accounted for around 70% of BERD while medium-sized enterprises show relatively weak levels of activity. More recently, micro-enterprises and small and medium-sized enterprises (SMEs) seem to have gained a larger share of R&D.

The number of business R&D units has risen significantly, from 258 in 1998 to 1 027 in 2006, with the main source of growth in the micro and small enterprise sector, which had just 256 units in 2000 (53.6% of the total), but 667 in 2006 (64.9% of the total). At the same time, however, the average size of these units (fulltime equivalent [FTE] researchers per unit) declined from 31.0 in 1991 to 6.1 in 2006. This compares to an average of some 25 FTE researchers for public R&D institutes. Given that a handful of enterprises, especially in the pharmaceutical industry, operate rather large facilities, many R&D units in a number of sectors may be below critical mass. The chemical industry (mainly related to pharmaceuticals) accounted for around 60% of total R&D spending by manufacturing companies in 2006; this means that five or six large companies account for 35-40% of total Hungarian BERD.

One of the four main innovation types could be found in 50.1% of the enterprises in West Transdanubia, so we can state that half of the enterprises are innovative. In the examined period, 22.2% of the regional enterprises implemented product-oriented innovations, 24.9% made innovation in the processes, 20.9% in organizational issues, and 32.4% carried out a marketing innovation. Among the activities related to innovation in enterprises of the
representative sample, purchase if machinery, equipment and software represents the highest share.

Innovative companies graded their own innovative activity to 6.7 on a scale ranging from 1 to 10, while they scored their own innovative activity compared to that of their major competitor to 89.56 (compared to 100 for the competitor company), which means that companies rate their own innovative activity below that of their competitor.

Biggest obstacle hindering implementation of innovative activities or projects to the highest degree seem to be excessively high expenses of innovation, while lowest barrier of the innovative activity is lack of technological information. As regard the future development plans we can state that the most preferred factor is development of the applied technology.

Measuring innovative capacity of the region, the two most outstanding feature of the region were the existence of appropriate suppliers and contractors, as well as the properly trained workforce. From among the supporting services behind the innovative activity, most enterprises used the product qualification, product analysis and marketing and the same are the services which can expect the highest demand in the near future, too. Only very few of the companies in our survey uses the most special kinds of counselling, namely those related to patents or intellectual property or help of business angels.

When examining location of purchases and sales, a dominancy of the county can be observed among all the places; per cent values of the county are only 44.4 for purchases and only 52.1 for sales, luck of competition with foreign companies can be one of the reason of the the relatively low innovative actions of the enterprises. Low values for the region indicate weaknesses of the regional cohesion and those of economic relationships within the region, as well as point to a lack of viability for the concept of planning-statistical regions.

Based on results of the questionnaire survey conducted in 2004-2005 among the enterprises in West Transdanubia on their innovative activities, the following conclusions can be drawn. Almost 80% of our representative sample is comprised of micro and small enterprises, so our conclusions apply mainly to the activities of this group of companies. The average R&D expenditure in the years 2004-2005 of the companies examined was 3.44% of their yearly revenues, however, 70% of the enterprises have absolutely no R&D spending.

**Patents**

The analysis of regional patenting is another way of assessing the concentration of innovative activities. For example, the number of Patent Cooperation Treaty (PCT) applications by region can be used to identify innovative regions which are important sources of world knowledge (OECD, 2007b). While, in general, inventive activities can be expected to be concentrated in a small number of regions, the degree of concentration in Hungary is much higher than in other OECD countries. It is, for example, nearly twice as high as in neighbouring Austria despite the rather strong position of Vienna in that country.
Geographic concentration in total PCT applications 2004.

![Bar chart showing geographic concentration in total PCT applications 2004.](image)

Source: OECD (2009)

Central-Hungarian Region ranks 34th among 203 EU regions in terms of economic performance because of the relatively high concentration of scientific and technological capacities. Only Prague and Bratislava are better positioned among the new EU member states. Two other regions, Central and West-Transdanubia, show relatively good economic performance, not least owing to large inflows of FDI. Owing to imported technologies, innovation performance has also been improving in these regions, but there is still rather little “homegrown” innovation, as local R&D capacities remain insufficient.
III.2 Entrepreneurship policies & institutional framework in the region-country mostly focusing on the impacts for the innovative enterprises, start-ups and spin-offs

- Regional innovation strategies, former and current surveys

*The West-transdanubian Regional Innovation Strategy (RIS)*

The innovation strategy programmes of the region was formed in 2001 and strongly related to the future vision and to the strategic objectives of the region. We introduce that former version, which is existing and the renewal process is in progress these months. The first regional stakeholder meeting will held at the end of November.

Innovation presented in the West Transdanubian region’s (Győr-Moson-Sopron, Vas and Zala counties) earlier strategies was considered especially according to the vision defined by the regional development program and the weight of the defined programmes. The regional development actors should note that the regional development programme considers the realization of its vision and the improvement of the regional competitiveness in innovation development. The West Transdanubian economic experts, decision makers, and the local politicians unanimously agree that the region’s competitiveness greatly depends on the underdeveloped institutions of higher education and research places creating knowledge, which have a weak position in comparison with national situation as well.

The objective of the development and effective implementation of the regional innovation programme is clear-cut. On one hand it aims at the improvement and enlargement of the innovation capacity of the West Transdanubian Region, on the other hand it targets at the improvement of the production of enterprises, which indirectly leads to the improvement of the regional competitiveness.

The main objective of the strategy was to increase wellbeing and the improvement of the quality of life with the formation of sustainable development. (figure1.). The prosperity of a region’s economy to a large extent depends on the productivity of its enterprises and institutions. In other words, the daily produced value or the value produced by the invested capital. On the other hand, the success of a region depends on the efficient utilisation of knowledge appreciation, and the continuous regeneration of technological innovation.

The West Transdanubian Region’s innovation strategy concentrated on improving the mentioned elements. The West Transdanubian Region’s innovation strategy is built on the already existing SWOT analysis, the company innovation surveys, and on priorities of the West Transdanubian Region’s regional development programme: the „human resources development” priority and the „entrepreneur and technological innovation” priority.
The milestones of the innovation strategy

The strategy makers found the negotiation procedure inevitable and the consideration of the reactions and opinions of regional innovation actors crucial. However, compromises had to be made! The strategy cannot take on the responsibility of stimulating the realisation of all different emerging innovations. According to this principle, and considering the conditions of the region, the strategy concentrates on realising the mechanical-technological innovation’s process, and the canalisation of the co-operation of innovation actors. The support programmes were defined according to this.

Furthermore its acceptance, the regional innovation strategy programme couldn’t be considered as a final document. The regional innovation strategic planning, indeed, is a long procedure involving several actors, which aims at winning the support of the regional actors, and the realisation of the common aim programmes‘.
The innovation strategy programme’s priorities and measures

**The improvement of the region’s innovation environment**

1.1. Innovation award and marketing  
   (Leader programme – short term)

1.2. Distribution of successful practices  
   (medium term programme)

1.3. Interregional co-operation  
   (medium term programme)

**Development of knowledge base and stimulation of knowledge diffusion**

2.1. Support of research and development innovation projects  
   (Leader programme – short term)

2.2. Innovation-focused courses and training’s support  
   (short/medium term programme)

2.3. Innovation networks, clusters and development co-operations  
   (medium term programme)

**Development of innovation infrastructure**

3.1. Support of research and development tools procurement  
   (Leader programme – short term)

3.2. Network of innovation centres and co-operation research  
   (medium term programme)

3.3. Development of innovation expert and consulting network  
   (medium term programme)

**Financing innovation**

4.1. Creation of regional innovation fund  
   (Leader programme – short term)

4.2. Tender preferences  
   (medium term programme)
• Priority to innovation projects in the region’s economic and regional developmental applications.

The priorities of the regional innovation programmes

According to the Regional Innovation Strategy programme (RIS), the programmes of the innovation strategy are discussed according to the following four priorities:

1. The improvement of the region’s innovation environment.
2. The development of the knowledge base and stimulation of knowledge diffusion.
3. The development of innovation infrastructure.
4. Financing innovation.

These are comprehensive priorities pointing out the direction for the long term, not only for the realisation of regional innovation strategy programme, but also to all other innovation related activities carried out by the innovation actors. The strategic programmes (priorities) help the realisation of the earlier demonstrated long-term milestones, the mission, and the strategic objectives. These strategic programmes are realised through short and medium term operative programmes (measures). These operative programmes include at least one ready to launch programme, and project proposals per measures.

1. Priority: Improvement of innovation environment of the regions

The analysis of the successful regions and cities showed that the formation of innovation potential is not only influenced by the continuous development of the knowledge base, but also by the quality of life and lifestyle and consumption forming supply elements of small regions and settlements. On settlement and small regional level it is crucial to consider and evaluate the factors influencing innovation, to point out the specialities of these factors, define the development paths, and finally carry out their specific development. With the improvement of the quality of life (housing, environment, cultural offers, local society), adequate economic and community supply, open and citizen friendly regional policy, and with specialised inner and outer settlement marketing, the innovation environment can be improved.

General Objectives:

• Preparation of a marketing strategy, which develops the region into an attractive innovation premise.
• In the region’s marketing concept, priority should be given to the description of the innovation environment.
• All written or electronic (internet) information brochure should demonstrate the tools and institutions for the formation of innovation environment.
• Examples of small regional, settlement level „best practice”, wide ranging successful innovation promotion.
• Successful local and regional products and innovation network development.
• The promotion of successful innovation centred enterprises „best practice” with the help of the knowledge circulation stimulation club.
• With active marketing activity, innovative enterprises and intensive research and development companies can be attracted to the region.
• The stimulation of interregional and cross-border innovation co-operations, stimulation of contact formation with the help of twin cities and county partner relations.

2. Priority: The improvement of knowledgebase and the stimulation of the knowledge

The educational level, directions of economic restructuring, and the intellectual capacities of the existing institution system in the West Transdanubian region provide the opportunity for the continuous learning and training in an even greater sphere. The results of international innovation research demonstrate that the ability to process and learn information is the most important and basic factor of innovation creation and receipt. In long term the region’s future and success is greatly influenced by the recognition of the importance of life-long learning, the continuous development of study-base, and the institution system’s activation to accept novelties.

General Objectives:

• Promotion of the innovation way of thinking.
• Stimulation of openness to new and changes.
• Organisation of innovation competitions, creation of innovation awards
• More attention to the innovation in the local media.
• Promotion of co-operations between research institutes and enterprises.
• Support the cluster created for the promotion of the region’s enterprises.
• Supporting the innovation consultation opportunities for small and medium size enterprises.
• Support of technological transfer.

3. Priority: The development of the innovation infrastructure

In several factors of the innovation, infrastructure is directly connected to the infrastructure elements of regional economic development. However their operation, and character requires a different handling. For the formation of the innovation infrastructure, a strong co-operation of regional development actors is necessary. Consequently, with national, local governmental,
and with the co-operation of the economic interest groups, the innovation infrastructure can be formed and developed from national and international funds. The reason for a regional innovation infrastructure network-creation is to avoid duplication and parallel developments, to ensure the institutional specialisation, and to ensure the flow of information and its utilisation.

General objectives:

• The development of the capacity of higher educational and the research institutions.
• The number of the research institutions has to be increased, in line with the region’s economic qualities and its knowledge based technological development.
• Support the creation and operation of industrial co-operation research centres.
• Foundation of measurement and material researching laboratories.
• Support for the tool and equipment-supply development of research centres.
• Enlargement of the libraries’ stock, and promotion of information centre creation.
• Founding and financing an innovation consultancy network.
• Simplification of technological information spreading method.
• The development of technological incubators, innovation centres, and their network development.
• Attracting researchers and developers to the region.
• Encourage the return to the region by students who studied in different parts of the country.

4. Priority: Financing innovation

One of the main goals is to increase the region’s low research and development investment rate (0.3% of the GDP) which is lagging behind in national level as well. If only the state research and development funds increase, a radical increase cannot be expected in the regional situation. The reason for this is that nowadays – like in the western countries - the national role has a greater weight, consequently the indirect stimulation tools have to have a greater role. The banks and venture capital companies are not able to solve the financing of some regional innovative enterprises, and other enterprise groups. These technology-oriented enterprises with growing potential require start up capital, which could be provided by the regional funds.

General objectives:

• Financing beginning technology oriented enterprises.
• Support of innovation oriented developments, and company co-operation.
• Support researchers, and graduates to become entrepreneurs.
• Co-financing the innovation consultancy.
• Tax reduction for the research and development oriented enterprises.
The innovation strategic programme's indicative source map

The financing of the strategic programmes in all cases can only be solved from several development resource funds. It is crucial to note about innovation developments -from the point of view of the society - that even the smaller funds can catalyse the region’s technological refreshment and growth of compatibility.

According to the West Transdanubian region’s regional development programme’s indicative funds, the region decided to realise cca.30 billion Forint development each year during the pre-accession period (2002-2003). In this amount, the EU, the governmental, the regional and the local funds are also included. Only a part of the mentioned fund will be dedicated to the innovation strategy’s operative programmes. However, it is essential that the West Transdanubian Regional Development Council ensures a great amount from its own resources to innovation developments.

<table>
<thead>
<tr>
<th>Priorities/measures</th>
<th>Phare CBC</th>
<th>Other EU funds*</th>
<th>Governmental</th>
<th>Region **</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Development of the region’s innovation environment</td>
<td></td>
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<tr>
<td>1.1. Innovation award and premises marketing</td>
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<td>1.2. Circulate success stories</td>
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<td>1.3. Interregional co-operation</td>
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<tr>
<td>2. Knowledgebase development and stimulation of knowledge diffusion</td>
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<tr>
<td>2.1. Supporting research and development projects</td>
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<td>2.2. Innovation centred trainings</td>
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<tr>
<td>2.3. Innovation networks and clusters</td>
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<tr>
<td>3. Development of the innovation infrastructure</td>
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<tr>
<td>3.2. Support for obtaining R+D equipments</td>
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<tr>
<td>3.3. Network of innovation centres</td>
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<td></td>
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<tr>
<td>3.4. Network of innovation experts</td>
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<tr>
<td>4. Financing innovation</td>
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<tr>
<td>4.1. Regional innovation funds</td>
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<tr>
<td>4.2. Tender preferences</td>
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</tbody>
</table>
Contact with regional agencies recommended; support activities – effectiveness of regional policies supporting company creation procedures and future development

**Pannon Novum West - Transdanubian Regional Innovation Agency**

The Pannon Novum West - Transdanubian Regional Innovation Agency programme 2004 – 2007 was headed by the West Transdanubian Regional Development Agency. In order to further develop the work of the agency, the Regional Innovation Council and five other organisations supporting regional businesses established a new corporation, under the name of Pannon Novum West - Transdanubian Regional Innovation Nonprofit Ltd.

After winning the proposal launched by The National Office for Technology and Research, the Regional Innovation Agency has started a new 3 year project on 1st August 2009. The main objective of the project is to promote the development of the innovation system in the West Transdanubian region, to create a regional, innovation supporting and stimulating and innovation-friendly environment, network co-operation, as well as to develop and expand new innovation services by enhancing the competitiveness of the micro, small and medium enterprises while increasing their innovation activities and attaining the following four objectives and activities:

**Public activities**

1. **Planning**
   (Assessment of innovation activities in the region, updating the Regional Innovation Strategy, improving the RIA’s strategic and operational plan, resource co-ordination)

2. **Network Development**
   (Building business relations, Regional Innovation Council, Cluster development)

3. **Information exchange**
   (Information transmission, developing knowledge databases)

4. **Education**
   (Networking Manager Training, Innovation Brokerage Training, Technological Transfer Seminar, Innovation Manager Course)

5. **Formation of Approach**
   (Communication activities, West Transdanubian Regional Innovation Agency publications, Regional Innovation Award)

6. **Consultancy Services**
   (Development of a consultancy audit system, generating Research & Development & Innovation projects, project development, Coaching, Spin-off and bridge building)
consulting, application / funding consulting, networking forums, organisation of conferences, consulting on know-how and industrial legal aid)

7. International Innovation Activities
(Participation in international networks, gathering and providing information, participating on national and international events, participation in international innovation projects, international study tours)

The Regional Innovation Agency (RIA) is operating within the frameworks of the Pannon Novum West - Transdanubian Regional Innovation Nonprofit Ltd.

Founders of the Pannon Novum Nonprofit Ltd.

West - Transdanubian Regional Development Council, Sopron
INNONET Innovation and Technology Centre Public Company, Győr
Universitas – Győr Nonprofit Ltd., Győr
West – Pannon Regional Development Plc. Szombathely
Chamber of Commerce and Industry of Vas County, Szombathely
Zala County Foundation for Enterprise Promotion, Zalaegerszeg

Services

- Application consulting – obtaining resources
- Application management and crisis management
- Innovation project development consulting
- Innovation research, audit and promotion
- Organisation of study tours, conferences
- Cluster services
- Complete management of the innovation process
- Education and mentoring programmes
- Innovation Marketing

Head Office
23. Köszegi street
9700 Szombathely
Hungary
www.pannonnovum.hu
- Existing regional/national programmes, mechanisms and tools supporting innovative entrepreneurship

**Science, Technology and Innovation (STI) strategy (2007-2013) and Implementation Plan of the Government**

The government adopted its mid-term STI-strategy for the period between 2007-2013 on 28 March 2007, which was incorporated in Government Resolution 1023/2007. (IV. 5.)

**Strategic Objectives**

The general objective of the strategy is to make Hungary's economy driven by knowledge and innovation on the mid-term, and to ensure that Hungarian companies display competitive products and services on the international market.

Mid-term objectives:
- To expand research and development activities of enterprises.
- To create internationally renowned R&D and innovation centres and research universities.
- To increase the research, development and innovation (R&D&I) capacity of regions.
- To create a market of knowledge based on competition and the recognition of performance through the globalization and industrialization of generating and disseminating new knowledge.
- To carry out giant scientific investments complying with policy priorities, primarily in regional centres and development clusters, and also to decrease regional discrepancies (improve regional cohesion).
- To increase the annual R&D spending dynamically, primarily as a result of an increase in enterprise spending.

**Principles of the Strategy**
- Principles of implementing strategic objectives
- Concentrating material and intellectual resources, and optimizing application.
- Improved social and economic exploitation of R&D results.
- Strengthening regional innovation.

**Strategic Priorities**

The following priorities are set forth by the strategy:
- Promoting the culture of exploitation and appreciation of scientific research results.
- Setting up a quality-, performance- and exploitation-driven, efficient national innovation system.
- Developing creative, innovative and appreciated workforce, complying with the demands of knowledge-based economy and society.
- Creating an economic and legal background that stimulates the generation and exploitation of knowledge.
- Promoting Hungarian enterprises, products and services which are competitive on the global market.

Indicators

The strategy sets forth indicators with target values and detailed requirements concerning institutions carrying out and coordinating research activities on the national and regional level, human resources, social environment, entrepreneurial innovation exploiting results, international cooperation as well as the financial and legal background.

Background of the Strategy

The STI strategy was compiled in accordance with the objectives of the National Concept of Development Policy (OFK), the National Action Plan (NAP) and the "New Hungary" National Development Plan (UMFT), it is based on a situation assessment.

Implementation Plan of the Strategy

Operative objectives, detailed tasks and the phases of strategy implementation are included in the implementation plan of the STI strategy. The document, containing almost one hundred tasks, sets forth specific implementation programmes, the funds and phases thereof, the changes in the government's management structure, amendments to the legal framework of technology and innovation as well as the importance and role of STI policy in government activities.
The Hungarian Innovation System

In order to improve competitiveness of the Hungarian economy, it has recently become inevitable to renew the national innovation system. Therefore, a comprehensive reform of the innovation system was started in 2003.

**Strengthening the financial and legal background of research and development and innovation**

In November 2003, the Act on the Research and Technology Innovation Fund (KTIA) was passed. The resources in the separate government fund consist of company contributions (initially 0.2% of their total annual turnover, later 0.25%, then, from 2006, 0.3% thereof) and matching government funding. Thus, the resources in the Fund do not depend on the annual budget negotiations. Enterprises may reduce their innovation contributions with the amount they spend on own research and development or R&D services ordered from government or non-profit research centres. As a result, the number of R&D enterprises grew from 430 to 630 last year. This improves the 2:1 ratio of government and company spending on R&D, which is just the opposite of that of developed countries, a target to be achieved by Hungary.

In December 2004, the Hungarian Parliament passed the Innovation Act, primarily aimed at improving the competitiveness of Hungary, contributing to the identification of a development path that is sustainable both economically and environmentally and indirectly improving the quality of life of the Hungarian population.

**Appointing government stakeholders of innovation policy**

Science and Technology Policy Council (TTPK) is top level government forum for science, technology and innovation, established by the government and chaired by the prime minister. The work of the forum is assisted by a counselling, decision preparing, coordinating and assessing body, the Science and Technology Policy Advisory Committee (4T).

The Agency for Research Fund Management and Research Exploitation (KPI) was established in August 2003 as a cooperating organisation of the Economic Competitiveness Operative Programme of the National Development Plan. Its tasks included the operation of the Hungarian innovation resources of the European Regional Development Fund and managing the Research and Development Innovation Fund.

KPI is supervised by the National Research and Technology Office (NKTH), a national government office established on 1 January 2004. The Office is primarily responsible for:

- coordinating the innovation activities of the government;
- improving the regional innovation system – preparing for the utilisation of European Structural Funds;
- monitoring and analysing the impact of R&D activities (strategic planning, impact analysis, building and maintaining innovation databases);
- disseminating the innovative approach;
- strengthening the cooperation between the knowledge base and the business sector;
- managing and improving the international relations of Hungarian R&D.

The government has also set up the Research and Technology Innovation Council, a body working along with the Office and dealing with strategic issues. The Council, in cooperation with the president of the Office, forms positions on the strategic issues of planning, operating and utilising the Fund.

**Strengthening regional innovation**

Parts of the national innovation system are unevenly developed which has an unfavourable impact on the competitiveness of the Hungarian economy as a whole. Therefore, improving the innovation capacity of regions became a priority in the last two years. In order to motivate regional development, 25% of the KTI Fund must be spent on regional innovation.

At its foundation, the first step of NKTH was to work out a strategic concept in order to develop the regions. In 2004, the office started two programmes to establish the system of organisations and instruments that generate and transfer knowledge and to provide for the necessary conditions. The objective of the Péter Pázmány Programme was to create Regional Knowledge Centres (RET) through the exploitation of R&D results of universities and to promote intensive cooperation with the industry. With the establishment of Regional Innovation Agencies, the background for the development of regional services was provided for.

**Exploitation of results**

Since its foundation in 2004, NKTH has been primarily working for the exploitation of the results of Hungarian research and development and improving the innovation capacity of companies. The goal of our support policy was to improve the competitiveness of Hungarian economy through innovation. The office worked out our programme portfolio in this spirit. One of its important aspects was to ensure a balance between short-term developments based of favourable conditions and long term goals. The office ensured that both types of initiatives may succeed, i.e. local, company and institutional (bottom up) initiatives on the one hand, and central, strategic initiatives on the other. Most of the programmes were available only for consortia with enterprises as members. Mental and financial resources were concentrated on priority areas while the support for giant projects implementing strategic programmes increased. For further information on our programmes, see: [www.nkth.gov.hu](http://www.nkth.gov.hu)
Further improvement of programme management

NKTH and KPI paid particular attention to further improve the programme management system. The office set up an evaluation and monitoring system for our programmes and the projects they include. NKTH streamlined the administration of calls. The office involved more and more industry, economy specialists and international experts in programme-assessment and in the evaluation committees.

Steps to further improve competitiveness of the economy

The innovation performance of most new EU member states, including Hungary, is below the EU average. However, the innovation performance of Hungary grows significantly quicker than the average. This is an obvious driving factor for the competitiveness of the economy.

In order to further improve competitiveness of the economy, though, the office need to maintain this growth. The National Office for Research and Technology, in cooperation with the Hungarian Academy of Sciences, worked out a mid-term R&D and innovation strategy for the government. The general objective of the strategy is to make Hungary a country, the economy of which is driven by innovation by 2013 and to ensure that Hungarian companies display competitive products on the international market.

Major goals defined in the strategy:

I. The rate of company spending on R&D should reach 1.4% of the GDP, whereas government spending should not exceed 0.7%.

II. Internationally acclaimed R&D facilities and centres should be created. Quality and efficiency of non-profit research centres should improve and result exploitation and links to the business sector should be strengthened. Top ranking research universities should be established in Hungary which work in close cooperation with companies and react flexibly to the needs of the economy.

III. Hungarian small and medium sized enterprises (SMEs) must receive special treatment. Working out the government strategy for the innovative development of SMEs is one of the most urgent priorities. Government subsidy should not only be a form of capital but a factor in motivating innovation activities.

The Government’s mid-term (2007-2013) science, technology and innovation policy (STI) strategy

The formation of a knowledge-based society and economy demands a high level of knowledge, which appears in new, marketable products and services. Science and innovation are essential factors in competitiveness and sustainable growth. At the same time, knowledge has become an important factor in quality of life.
Innovative Hungarian economy

The Hungarian economy and society must step into new fields of development based on knowledge and innovation in order that Hungary can with knowledge-intensive and innovative activities, giving to its products the greatest added value, become connected with the world economy. Sustainable development of the Hungarian economy can only be realized in an environment that stimulates innovation.

Strategic goals

The general goal of the strategy is that in the mid-term Hungary shall become a country where knowledge and innovation are the driving engines of the economy and companies appear on the global market with competitive products and services.

The mid-term goals:
- Expansion of companies’ research and development activities
- Establishment of internationally recognized research & development-, innovation centres and research universities
- Enhancing of the regions’ research & development & innovation (R&D&I) capacity
- Establishing a knowledge market which works on the principles of performance recognition and competition through the globalization of knowledge production and dissemination,
- Investment in large scientific facilities, primarily in the regional centres and the development poles, reducing regional differences (regional cohesion).
- The dynamic increase in yearly R&D expenditure, above all as a result of growth in corporate expenditure

Strategic principles

Principles of realizing the strategic goals:
- Focusing of intellectual and financial resources, optimization of utilization.
- Increased economic and societal implementation of R&D results.
- Strengthening of regional innovation.

Strategic priorities

The strategy designates tasks in the following priority areas:
- A culture of acceptance and utilization of scientific research results.
- Quality-, performance-, and utilization-driven efficient national innovation system.
- Well-honoured creative and innovative workforce suitable for the demands of knowledge-based economy and society.
- Economic and legal environment with incentives for creation and utilization of knowledge.
- Domestic companies, products and services that are competitive on the global market.

*Connection with other strategic documents*

The current strategy was prepared in harmony with the objectives of the National Development-policy Concept (NDC), National Action Program (NAP) and the New Hungary Development Plan (NHDP). The situation-analysis can be found in the Appendix. The details of implementation (operative goals, tasks and schedules) are described in the STI action plan.
The relevant national programs supporting innovation activities

**GOP (Economic Development Operational Program Priority I)**

These programmes encourage industrial research and experimental development programmes exploitable for the economy and to be implemented in close cooperation between enterprises, universities and research institutes and also provide assistance to building modern research infrastructure, to applications for patents and in certain areas of primary importance to the permanent renewal of utilizable knowledge and to their expedience in market environment. Furthermore these programmes are targeted at establishing innovation and technology parks, hosting research and innovative enterprises and improving the existing institutional system. The focal points of these programmes are as follows:
- intensifying the presently low activity of domestic corporate R&D innovation;
- a more efficient utilization the existing capacities and results;
- and increasing the cooperation between the stakeholder actors.

**Regional Development Operational Program (KDOP)**

The Priority Axis 1 of the Operational Program of KDR (Regional Development Agency of Central-Transdanubia) for the programming period 2007-2013 concentrates on the development of regional economy. In this aspect it encourages setting up an internationally attractive regional economic environment, the promotion of competitive, innovative economic cooperation systems and networks, stimulating the building of an innovation-oriented network of regional economy and improving the skills and abilities of the domestic owners of small and medium-size enterprises.

**TIOP (Social Infrastructure Operational Program) - 1.3.1. scheme**

The objectives of the scheme are as follows:
- improving the infrastructure necessary for the qualitative improvement of the R&D+I and training activities of higher educational institutes,
- creating the necessary infrastructural and technological background for increasing the number of students educated at faculties of technology and natural science by modernizing and improving the supply of research equipment and instruments in the fields of mathematics, natural sciences, technology, IT and life sciences.

**TÁMOP (Social Renewal Operational Program) – higher educational R&D schemes**

These schemes assist to the promotion of the technology transfer of higher education institutes, the supporting of the selected basic research projects of innovative research teams, the publication of the scientific results of higher education institutes, the planning of a tutorial-researcher lifelong career and the promotion of talented Hungarian students. They also contribute to the qualitative improvement of education and research, to increasing the
ratio of eminent students and tutor-researchers and urges for achieving excellent results. A further objective of the schemes is involving foreign researchers or Hungarian professionals working at foreign research institutes into Hungarian research projects easing in such way the integration of home-coming Hungarian or foreign researcher-tutors into the domestic world of science.

**OTKA (Hungarian Scientific Research Fund Basic programs)**

By the grants of OTKA such scientific researches and the creation of preconditions needed for their performance and publication can be sponsored through a public tendering system which can guarantee the recognition of new scientific trends, knowledge, methods and procedures. The grants of OTKA may also be allocated for infrastructure development purposes contributing to the achievement of such scientific results.

**KTIA (Research and Technology Innovation Fund)**

The objective of KTI Fund is promoting the establishment of an innovation-driven, knowledge economy and society. The programmes are inspiring the birth of products, technologies or services from knowledge and innovative ideas which can be sold on world market.

This is expressed by the „From Idea to Market” action plan with the following major objectives:
- Improving knowledge bases, building knowledge bases complying with international standards;
- Supporting R&D programs linked to National Strategic objectives;
- Increasing the utilization efficiency of R&D results, intensifying the foundation of innovative enterprises, Introduction of technological and business incubation;
- Development of regional innovation;
- Intensifying international R&D cooperation, fostering Hungarian participation in EU R&D programs.

The Fund’s major programs are as follows: Pázmány Péter Program, Asbóth Oszkár Program, Baross Gábor Program, Irinyi János Program, Apponyi Albert Program, Déri Miksa Program, Kozma László Program, Óveges József Program, Polányi Mihály Program, Teller Ede Program.
The relevant national programs supporting innovation activities 2009-2010
(in billion Forint)

Overview of the Research and Technological Innovation Fund

Legal background

Act XC of 2003, approved by the Hungarian Parliament on November 10, 2003, established the Research and Technological Innovation Fund, which provides stable and reliable financing for RTDI activities. The independent government Fund is envisioned to promote demand driven innovation and the knowledge based competitiveness of companies. The Fund is financed by mandatory contributions of all companies registered in Hungary, matched yearly by the government budget. The so-called innovation contribution, based on the of the (adjusted) net turnover, for medium size and large companies grows from 0.2% in 2004 to 0.3% by 2006. Micro-enterprises and small-size enterprises are exempt from paying a contribution. Direct R&D expenditures, both intramural and ordered from public R&D units, can be deducted from the contribution thus stimulating innovation activities. The company payments into the transparent, dedicated RTDI Fund shall be used for the direct or indirect benefit of the private sector, as stipulated in the legislation creating the Fund. It is also a legal requirement that resources of the Fund be spent through competitive calls, and at least 25% should go for regional innovation purposes.
Use of the financial resources of the Fund

Strategic issues relevant to the Fund shall be addressed by the Research and Technological Innovation Council. The majority of the members of the Council shall comprise of non-governmental representatives of the economic and scientific communities. The Council shall have a right of approval concerning the establishment of the utilisation plan and the strategy for the calls for proposals for the Fund, including determination of the means and tools of funding and decision-making relevant to the provision of financial assistance.

Competitive schemes financed from the Fund

The various competitive schemes include:
- Regional University Knowledge Centres
- Regional Innovation Agencies
- National Research and Development Programs
- Creation of R&D and Innovation Centre for Mobile Communication (Mobil 2004).
National RDI support programme structure 2008

1. National Technology Programme (Technology)

The National Technology Programme supports mid-term R&D activities which have a potential for bringing about scientific and technology break-through in the given field. The programme aims at increasing the competitiveness and sustainability of the economy by promoting mid-term application-oriented strategic R&D in the field of modern technologies. The programme promotes innovation in 5 technology areas, which are the sub-programmes of this call (Biotechnologies, Nano- and Micro-Technologies, Material- and Production-Technologies, Information and Communication Technologies and Environmental Technologies), while taking Hungarian R&D strategy into consideration. The programme strategy is set for three years. The calls for proposals consist of two parts, a set of general rules on the one hand, which remains effective unchanged for three years, and the annually changing work programmes containing the specific calls. Apart from the sub-programmes published continuously, independent calls are published twice a year. Submission deadlines are expected at the end of February and the beginning of September. Under the two calls in 2008, NKTH wishes to set the professional orientation of proposals by publishing 4 sub-programmes and 8 dedicated calls. The Office focuses the structure of specific sub-programmes by setting priorities. Each call comprises the criteria of proposal submission which may vary from call to call. Funding period may vary from 1.5 to 4 years pursuant to the provisions of the given call. The budget of funding shall be HUF 50 billion for 3 years, while funding intensity may be between HUF 200 million/project/period and HUF 1 billion/project/period. The expected number of proposals receiving funding shall be 40-80, which - from monitoring and evaluation point of view - shall add up to a 150-project portfolio during 3 years.

2. Strengthening Knowledge Base (Knowledge Base)

Knowledge Base calls promote the exploitation of R&D results and the implementation of innovation initiatives, furthermore they support researcher training, building relations, acquiring experience, building carriers in research and nourishing talents.

2.1 Individual Implementation of R&D Results and Innovative Ideas (IDEA)

2.2 Regional Programmes

Decentralized Regional Programmes (Regional)
- INNO-CHECK
- INNOREG (Regional Innovation Agencies)

2.3 NKTH-OTKA Cooperation (OTKA)

- NKTH-OTKA Call Supporting Targeted Basic Research (OTKA_A)
- NKTH-OTKA Call Supporting Human Resources (OTKA_H)
2.4 Maecenas Calls

- "Mecenátúra" - Sponsorship
- Supporting Researcher Carriers (Carrier)
- Patents Call (IP)
- Cyber Generation - Call for Informatics Ideas
- Innovation and Society (Innotárs)
- National Technology Platforms (Platform)

2.5 Competitive Research

- National Scientific Information System (EISZ)
- National Research Infrastructure Development (NKI)

3. International Co-operations (International)

3.1 Project cooperations

- International Giant Projects (NAP)
- Promoting Hungarian participation in EUREKA programme
- Ambient Assisted Living (AAL)
- EUROSTARS
- ARTEMIS/ENIAC
- CORNET

3.2 Building relations

- Call for Building Consortia
- Bilateral International Co-operation (S&T)
The regional innovation programmes and strategy in past four years in West Pannonia:

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Exploitation of IPR

The protection of industrial property and intellectual property rights are the responsibility of the Hungarian Patent Office (HPO). Research results may appear in innovative products or in intellectual property rights. Among others, the following pieces of legislation promote the IPR protection:

- Act XXXIII of 1995 on the Protection of Inventions by Patents
- Act XI of 1997 on the Protection of Trademarks and Geographical Indication
- Act LXXVI of 1999 on Copyrights
- Act XLVIII of 2001 on the Legal Protection of Designs

The exploitation of research results is a natural process at profit oriented enterprises as the goal of these enterprises is to maximise their profit and to get a good return on their investments. Although public research units in Hungary have significant R&D and innovation potentials, exploitation of research result is not typical in their case. Very often, valuable inventions, technologies and know-how lie idle.

The objective of Act CXXXIV of 2004 (Innovation Act) is to promote the improvement of Hungary’s ability to generate income based on knowledge and technological innovation and serving sustainable development. According to section 18 of the Act, all public research institutions, public foundations and non-profit companies founded by the sub-systems of public finances which qualify as research institutions shall have the Rules for Intellectual Property Rights Management effective as of 1st January 2006. Organisations supported by the Research and Technology Innovation Fund shall submit their Rules for IPR Management to the funder. The validity of such Rules shall be checked whenever a new funding contract is drafted. Without such Rules, the Agency for Research Fund Management and Research Exploitation (KPI) shall not enter into a funding contract with any of the above organisations.

To help public research institutions to prepare their own Rules for IPR Management, the National Office for Research and Technology (NKTH) and HPO published a Methodology Guide. According to the Guide, the following areas should be regulated: ways to exploit inventions (official and by employees) created at the given research unit (procedures to follow, motivation of researchers, basis of license agreements, framework of founding spin-off companies, etc.). Most of the organisations already have such Rules, so the exploitation of research results is usually carried out in a regulated environment. In many cases, offices for technology transfer were set up in the organisations to facilitate the process. There are organisations in which this activity is carried out in separate companies.

The objective of NKTH is to motivate the exploitation of research results and promote technology transfer. Utilisation may happen in two different ways: parties may sign a licence agreement or the organisation may set up a spin-off company. According to the Innovation Act, spin-off companies are enterprises set up to exploit a research result created at a public research institute and partly owned by the given research unit. Our goal is to help setting up...
an increasing the number of such spin-off companies. This goal receives priority in our calls for proposals (for example in Péter Pázmány Programme and Gábor Baross Programme). Unfortunately, setting up spin-off companies is often hindered by slow decision making and the lack of necessary managing skills.

- Available or already implemented EU programmes supporting innovative entrepreneurship, legislation, initiatives and allowances for the sake of SME creation and development

The experiences of cross-border co-operation

In the last decade, the most significant area of co-operation across borders was the allocation of European Union sources within the frame of the Phare-Interreg co-operation. The launch of the Hungary-Austria Phare CBC program became possible in 1995, when Austria became a member-state of the EU. The program has been functioning ever since, the execution of the project on the Austrian side is being financed by the EU INTERREG II/A program. The Hungarian counties select the projects together with the Austrian provinces in the Joint Programming and Monitoring Committee (JPMC), and they are consented to by the Phare Co-ordinating Committee in Bruxelles. The realization of the initiatives generally takes several phases and several years.

The program allocated 7 million Euros for 1995, of which 88% was utilized until the contractual deadline. Twenty big projects and more than fifty small ones were realized from the funds, among others the elaboration of the concept of the West-Transdanubian regional development and the reconstruction of the airport of Győr-Pér.

In the course of the 1996 program, 25 projects were realized. The consented budget fund was 11 million Euros. The execution is being carried out according to plans, approximately 1.5 million Euros, the 14% of the total amount, has been allocated so far. Major projects, such as the construction of a main road by-passing Zalaegerszeg, the industrial park of Szentgotthárd, the construction of the bicycle road along the Danube, and the Ro-Ro port at Győr-Gönyü have been accomplished.

The number of projects in the 1997 Hungarian-Austrian program was 20, the consented budget frame was 14 million Euros. It involved the execution of projects such as the enterpreneurial zone of Sopron, the innovational park of Szombathely, or the Írottő National Park. The budget frame of the 1999 program was 10 million Euros.

Since 1995, 4 tri-lateral CBC programs have been functioning with the participation of Hungary. The Hungary-Slovenia-Austria Phare CBC program allocates a fund of 1.5 million Euros each for projects selected in Vas and Zala counties in Hungary and the Mura area of Slovenia for a utilization negotiated with Southern Burgenland, primarily for the tri-lateral Natural Park framework project and the territorial planning project.
The fund of the 1996 program was also 1.5 million Euros. Concerning the Hungary-Slovakia-Austria Phare CBC program, the partner countries have signed a joint declaration of intent in December 1997, and handed in the two-year framework program for consent to the EU Committee. The signature of the agreement between the EU and Hungary in 1998 indicates the official Hungarian launching date of the program. This implies that Hungary and Slovakia will receive a development support of 3 million Euros each, for two years (1995 and 1996).

The target area of the programs is Győr-Moson-Sopron county in Hungary, South-west Slovakia in Slovakia, and Burgenland, Vienna and Lower Austria in Austria, and naturally, where necessary, other areas can also join in. This region stretching across borders became known in the European development policy as the Vienna-Bratislava-Győr Economic Golden Triangle, and naturally the program exploits the extraordinary potentials of the three cities.

Nevertheless, the program is that of the complete cross-border region, therefore it involves other cities such as Eisenstadt, Sopron, Mosonmagyaróvár, Nitra, and Dunaszerdahely, and areas such as the Fertő-Hanság National Park, the Szigetköz Landscape Protection Area or the valley of the River Morava. The program is divided into 14 projects, and its core is the creation of the common regional development strategy.

There were only 10 months available for the utilization of the funds of 1995. Therefore, the development program of the Vienna-Bratislava-Győr tri-border region, the development of the system of spacial information of the Fertő-Hanság National Park and that of the Szigetköz Landscape Protection Area, the 1st phase of the development of Tele-houses assisting the cross-border communication of 16 settlements in Győr-Moson-Sopron county and the construction of bicycle roads connecting Austria, the Czech Republic, Hungary and Slovakia, can be accomplished by the end of the following year.

The budget of the 1996 program is 1.5 million Euros. Until 2000, the following projects had to be executed: Vienna Tele-cooperational Center, regional subsoil-water management concept in the border area of Hungary, Austria and Slovakia, CERNET Education Transfer Central European Network European Comprehensive School, Training and Visiting Center of Food-Science and Bio-technology in Mosonmagyaróvár.

The main priorities supported by the cross-border co-operation program are the following:

- Regional planning and development,
- Development of the technical infrastructure (e.g. development of the Győr-Gönyű RORO port, modernisation of road no. 74 by-passing Zalaegerszeg, Győr-Pér airport development projects),
- Economic development and co-operation, within this innovation-oriented economic development (e.g. construction of the Industrial Park in Szentgotthárd, Győr Commercial Center, cross-border employment policy projects),
- The development of tourism and accommodation (e.g. bicycle road along Lake Fertő, publication about the touristic services of Natural Parks projects),
- Human resource development, within its scope the extension trainings of small and medium-sized companies or touristic trainings, educational co-operation,
- Environmental and nature-protection (e.g. Őrség-Raab-Goricko Natural Park, the dangerous-waste combustion plant in Nagykanizsa)

**Interregional programmes**

The Regional Development Agency has managed the following R+D+I interregional projects the past 4-5 years:

INTERREG IIIC
- CLOE – Clusters Linked over Europe (2007. június - március)

FP6

INTERREG IV A

INTERREG IVB – Central Europe

INTERREG IIIIB-CADSES

The Competitiveness and Innovation Framework Programme (CIP)

The Competitiveness and Innovation Framework Programme (CIP) aims to encourage the competitiveness of European enterprises. With small and medium-sized enterprises (SMEs) as its main target, the programme supports innovation activities (including eco-innovation), provides better access to finance and delivers business support services in the regions. It encourages a better take-up and use of information and communications technologies (ICT)
and helps to develop the information society. It also promotes the increased use of renewable energies and energy efficiency. With a total budget of €3621 million the programme runs from 2007 to 2013.
III.3 Main actors contributing to the development of innovative capability of the region

- The main actors encouraging innovation in the region - business parks, research & technology parks, incubators, research institutes, universities, clusters, innovation funding entities etc. possible interrelations

III.3.1. Business parks

By now the 24 Business Park formed in the region almost completely cover the area of the region and it can be observed that - beside the foreign enterprises - these Parks play a prominent role in the growth of the local economic players, especially SMEs.

**Occupancy rate of Business Parks in 2006**

<table>
<thead>
<tr>
<th>Number of Business Parks</th>
<th>Total area, acres</th>
<th>Net area, acres</th>
<th>Occupied area, acres</th>
<th>Occupancy for the total area, %</th>
<th>Occupancy for the net area, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Győr-Moson-Sopron</td>
<td>7</td>
<td>521.7</td>
<td>430.3</td>
<td>289.3</td>
<td>55.4%</td>
</tr>
<tr>
<td>Vas</td>
<td>6</td>
<td>583.7</td>
<td>429.3</td>
<td>298.5</td>
<td>51.1%</td>
</tr>
<tr>
<td>Zala</td>
<td>9</td>
<td>395.8</td>
<td>371.4</td>
<td>246.3</td>
<td>62.2%</td>
</tr>
<tr>
<td>West Transdanubia</td>
<td>22</td>
<td>1501.3</td>
<td>1231.1</td>
<td>834.1</td>
<td>55.6%</td>
</tr>
<tr>
<td>Central Hungary</td>
<td>30</td>
<td>1138.7</td>
<td>970.1</td>
<td>509.4</td>
<td>44.7%</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>29</td>
<td>2425.9</td>
<td>2116.1</td>
<td>1271.5</td>
<td>52.4%</td>
</tr>
<tr>
<td>South Transdanubia</td>
<td>17</td>
<td>777.0</td>
<td>682.6</td>
<td>462.8</td>
<td>59.6%</td>
</tr>
<tr>
<td>North Hungary</td>
<td>25</td>
<td>1352.6</td>
<td>1176.3</td>
<td>847.0</td>
<td>62.6%</td>
</tr>
<tr>
<td>North Great Plain</td>
<td>26</td>
<td>1362.1</td>
<td>1188.6</td>
<td>690.1</td>
<td>50.7%</td>
</tr>
<tr>
<td>South Great Plain</td>
<td>30</td>
<td>1330.8</td>
<td>1159.2</td>
<td>627.3</td>
<td>47.1%</td>
</tr>
<tr>
<td>Hungary</td>
<td>179</td>
<td>9888.5</td>
<td>8524.0</td>
<td>5242.3</td>
<td>53.0%</td>
</tr>
</tbody>
</table>

* data of parks awarded with the Business Park title in 2006 or 2007 are not included

Source: Ministry for Economy and Transportation
An ever growing portion of the Business Parks realize that enterprises need a more complex service, beyond the simple purchase of the site, especially on the innovation field. Significant majority of Parks already manage extension of their services as a priority, to provide innovation services, either by creating a separate innovation centre in the Park, or with the help of involving cooperative partners.

If we compare the influence of Parks operating in the West Transdanubian region with data of Parks in other regions, it is apparent that - though there is the lowest number of Business Parks in the region except for the South Transdanubian region - West Transdanubia stays on the second place following the much more industrialized Central Transdanubia with respect to several parameters: the available total and net area to build in, the already built-in area, number of employees in the resident enterprises, revenues of the enterprises, or even the amount of capital invested into the Business Parks. This existing Business Park background and the more and more Hungarian enterprises operating there constitute a prominent basis for the innovation-controlled development of the region.

By 2006 total area of Business Parks in West Transdanubia exceeded the 1500 acre value, from which the net floor space to be built-in exceeds the 1200 acres value. Number of resident enterprises is increasing from year to year, it now approaches 350 companies. There are Parks that are nearly full and the occupancy rate in regional level approaches 68% resulting in the need to involve new areas into the developments.

Enterprises in Business Parks employ nearly 40 thousand people which means that on average one Park employs 1800 persons, in other words, 12.5% of the employees in the region find up-to-date working environments at enterprises working in one of the Business Parks.

Of course there are significant differences among the parks, as in parks operating since nearly 15 years in the major industrial centres number of the resident enterprises still exceeds 30 (in Győr this number is over 80), while number of companies in a park of a minor township is much lower, is under 12 on average, and obviously their role in employment is also minor.
### Business Parks in the West Transdanubia region

<table>
<thead>
<tr>
<th>Business Park</th>
<th>Settlement</th>
<th>Business Park title, year</th>
<th>Area (acre)</th>
<th>No. of enterprises</th>
<th>No. of employees, persons</th>
<th>Investment, Million HUF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Győr Business Park</td>
<td>Győr</td>
<td>1997</td>
<td>156</td>
<td>65</td>
<td>6000</td>
<td>55300</td>
</tr>
<tr>
<td>Sárvár Business Park</td>
<td>Sárvár</td>
<td>1997</td>
<td>38</td>
<td>10</td>
<td>3030</td>
<td>3350</td>
</tr>
<tr>
<td>Sopron Industrial and Innovation Park</td>
<td>Sopron</td>
<td>1997</td>
<td>19</td>
<td>3</td>
<td>220</td>
<td>1400</td>
</tr>
<tr>
<td>Szentgotthárd Business Park</td>
<td>Szentgotthárd</td>
<td>1997</td>
<td>145</td>
<td>31</td>
<td>1600</td>
<td>253000</td>
</tr>
<tr>
<td>Claudius Industrial and Innovation Park</td>
<td>Szombathely</td>
<td>1997</td>
<td>185</td>
<td>41</td>
<td>8682</td>
<td>52656</td>
</tr>
<tr>
<td>Rédiics Business Park</td>
<td>Rédiics</td>
<td>1998</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mura Business Park</td>
<td>Letenye</td>
<td>1999</td>
<td>13</td>
<td>7</td>
<td>80</td>
<td>121</td>
</tr>
<tr>
<td>Industrial Logistical and Business Park</td>
<td>Mosonmagy aróvár</td>
<td>1999</td>
<td>93</td>
<td>3</td>
<td>823</td>
<td>4908</td>
</tr>
<tr>
<td>Ganz Business Park</td>
<td>Zalaegerszeg</td>
<td>1999</td>
<td>10</td>
<td>6</td>
<td>248</td>
<td>8</td>
</tr>
<tr>
<td>Zalaegerszeg Business Park</td>
<td>Zalaegerszeg</td>
<td>1999</td>
<td>28</td>
<td>8</td>
<td>5000</td>
<td>700</td>
</tr>
<tr>
<td>Industrial and Logistical Park of Celldömölk</td>
<td>Celldömölk</td>
<td>2000</td>
<td>29</td>
<td>10</td>
<td>1329</td>
<td>3173</td>
</tr>
<tr>
<td>Kapuvár Business Park</td>
<td>Kapuvár</td>
<td>2000</td>
<td>67</td>
<td>27</td>
<td>1345</td>
<td>1264</td>
</tr>
<tr>
<td>Business Park and Logistical Centre of Nagykanizsa</td>
<td>Nagykanizsa</td>
<td>2000</td>
<td>131</td>
<td>52</td>
<td>4091</td>
<td>426</td>
</tr>
<tr>
<td>Regional Business Park</td>
<td>Pacsa</td>
<td>2000</td>
<td>30</td>
<td>12</td>
<td>240</td>
<td>340</td>
</tr>
<tr>
<td>Zahalovó Business Park</td>
<td>Zahalóvó</td>
<td>2000</td>
<td>28</td>
<td>10</td>
<td>388</td>
<td>2819</td>
</tr>
<tr>
<td>Lébény Industrial Zone</td>
<td>Lébény</td>
<td>2001</td>
<td>36</td>
<td>3</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>Türje Business Park</td>
<td>Türje</td>
<td>2001</td>
<td>38</td>
<td>8</td>
<td>395</td>
<td>660</td>
</tr>
<tr>
<td>Lenti Business Park</td>
<td>Lenti</td>
<td>2002</td>
<td>56</td>
<td>15</td>
<td>554</td>
<td>2452</td>
</tr>
<tr>
<td>Csorna Business and Logistic Park</td>
<td>Csorna</td>
<td>2003</td>
<td>24</td>
<td>6</td>
<td>120</td>
<td>855</td>
</tr>
<tr>
<td>Rába Business Park</td>
<td>Győr</td>
<td>2005</td>
<td>81</td>
<td>13</td>
<td>2500</td>
<td>32000</td>
</tr>
<tr>
<td>Körmend Business Park</td>
<td>Körmend</td>
<td>2005</td>
<td>65</td>
<td>1</td>
<td></td>
<td>32000</td>
</tr>
<tr>
<td>Répcelak Business Park</td>
<td>Répcelak</td>
<td>2005</td>
<td>21</td>
<td>5</td>
<td>617</td>
<td>855</td>
</tr>
<tr>
<td>Sopron South-Eastern Business Park</td>
<td>Sopron</td>
<td>2005</td>
<td>34</td>
<td>7</td>
<td>627</td>
<td>6350</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>1349</td>
<td>343</td>
<td>37889</td>
<td>423032</td>
</tr>
</tbody>
</table>

*Source: Pannon Economical Initiative.*
III.3.2. Innovation & Technology Centers

In some of the industrial and business parks in West Transdanubia, innovation and technology centres have been established to stimulate the innovation activity of small- and medium-sized firms and technology transfer.

One more innovation centre is starting its operation also in the industrial park of Sopron and also in Szombathely, while in Zalaegerszeg and Nagykanizsa two new innovation and technology centre is under preparation which will focus on wood and furniture industries and mechatronics.

1. INNONET Innovation and Technology Centre, Győr

The most important one of them is the INNONET Innovation and Technology Centre, which is located in the Business Park Győr and is equipped with a modern communication equivalent to that found in similar European centres targeting start-up companies. INNONET provides a wide range of administrative, management, and training services at reduced rates for such companies.

The center work is based on the firm belief that long term socio-economic benefits of innovation processes significantly exceed the earnings of individual companies participating in them. Committed to this observation, INNONET was established as a non-profit organization to aid innovative small and medium enterprises and thus foster the development of the West-Transdanubian Region.

The Centre also tries to create important synergies between the international firms settled in the Győr Business Park and the local innovative small -and medium-size ventures. It has very good relationships with similar austrian institutions (e.g., Eisenstadt, Wiener Neustadt, Seibersdorf) and runs several joint projects with these partners.

Priority business fields:
- Offering office and workshop space for innovative enterprises at a reduced rate. Rental in our building is bundled with many additional free services for our tenants (including availability of discussion rooms, event organization support, copiers etc.)
- Acting to identify new ideas and innovation challenges; framing and management of innovation projects on regional and trans-regional (cross-border) level

Target groups:
- Companies (mainly Start Ups) with a strong technology focus, specialized know-how and high growth potential (Supported by basic office and IT services to aid their management to focus on core business activity)

- Small enterprises (including Spin-offs) ready to participate in supplier chains (becoming partners of TIER I-II companies etc.) or act as project partners in research cooperations. (Supported by additional advice regarding available funding, application procedures and project management)

Being settled in the International Industrial Park of Győr, optimal transport conditions (next to a highway exit, close to the Slovakian and Austrian border), well-kept, clean environment with pleasant Park vegetation, silence and available free parking space is considered by many of our tenants as a key strength of our Centre.

**Key facts of our infrastructure:**
- Total floor space: 2500sqm.
- Offices available: 27 pcs; (20sqm each)
- Co-location office: 1 shared office with 4 individual co-location workdesks.
- Workshops available: 10 pcs; (60sqm each)
- Meeting rooms: 100sqm / 80 seat, 40sqm / 15 seat and 10sqm / 5 seat.

---

2. **Innovation and Technology Centre Sopron**

The Innovation and Technology Centre located in the Industrial and Innovation Park of Sopron. The centre is driving ventures which are producing high technology level products, and helping the development of the town and the region with their services. Their work do not need large space, but use high-tech instruments, and employ the high qualified local human power.

So the Park helps ventures which cause minimal environmental damage, use high-tech and telecommunication instruments, deal with environment and nature protection or medication. All the public works can be used by the tenants.

It supports the incomers with widespread services (guidance, business partner coverage, etc.). Our goal is to help the formation and growth of local, novice, innovative enterpreneure in all together 4428 sqm.

The Centre cooperates with the West-Hungarian University and researcher centres to cover the development of the tenants.

The Industrial and Innovation Park of Sopron can be found at the north-east side of the town, near the main road 84 to Vienna. We create a technological innovation park because of the structure of extant human power, the future economical break-out chances, the regional development plants and the intellectual potency of the West-Hungarian University.
The Park area is 60 hectares. In the first step we take the public works on 18 acres, which are in the property of Industrial and Innovation Park of Sopron. The public works are ready to use from 2000 November.

3. **Claudius Technology Incubator and Innovation Centre Szombathely**

The Technical Incubator House and Innovation Centre located in Claudius Industrial and Innovation Park, 1500 m2 has been built with the mission of supporting mainly the following businesses:

- Starting-up enterprises operating in the high-tech industries
- Innovative operations
- R+D activity
- Entrepreneurs wishing to comply with the new economic needs
- Potential suppliers of multinational companies
- Starting-up networks and clusters

The Technical Incubator House and Innovation Centre offers various services in outstanding circumstances characterised by high level of infrastructure.

Three workshops and a total of 340 m2 office space are to be rented in the newly built Incubation House provided with lift. The workshops of 75 m2 floor area and 5.8 m clearance are situated the ground-floor and provided with electricity and condensed air availability as well as a separate social block, thus they can be used either warehousing, manufacturing or commercial purposes.

The offices are situated the ground-floor and on the 2nd and 3rd floor and have the following features: plastic doors and windows, internet connection, separate meeting-room and files room, individual air-conditioning availability, conference room renting availability within the building at favourable rates.

The innovation center provides various services:

- Economical office and workshop rentals
- Office services
- Service provision and mediation
- Organisation of training sessions and programs
- Meeting and conference room to rent

4. **Innovation and Technology Centre Zalaegerszeg**

This is a new initiation by the city government.
Former barracks in city centers, near economical campus.
Owner: Zalaegerszeg city
5. Innovation and Technology Centre Nagykanizsa

This is a new initiation by the city government.
Former „Gábor Áron” & „Kossuth Lajos” barracks
Owner: Nagykanizsa city
Size: 55 ha
Infrastructure: full
Utilization:
- part of an industrial park (logistic center)
- continuous reconstruction
- offices, assembly shops, depots
III.3.3. Incubators

At the beginning of the 90's a local enterprise agency was established in each counties of Hungary, in the framework of the Phare program of EU and the enterprise promotion program started by the Hungarian Foundation for Enterprise Promotion, in order to support the enterprises of the region and diffuse the enterprising culture. In Zala county the Zala County Foundation for Enterprise Promotion has been established in 1992 by the participation of the Municipality of Zala County, as the sole founder.

Zala County Foundation for Enterprise Promotion
Address: 17 Köztársaság str. 8900 Zalaegerszeg Hungary

Suboffice of Lenti Zala County Foundation for Enterprise Promotion
Address: 4 Deák str. 8960 Lenti Hungary

Suboffice of Zalaszentgrót Zala County Foundation for Enterprise Promotion
Address: 2 Csány L. str. 8790 Zalaszentgrót Hungary

<table>
<thead>
<tr>
<th></th>
<th>Zalaegerszeg</th>
<th>Lenti</th>
<th>Zalaszentgrót</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Establishment:</td>
<td>1992</td>
<td>1992</td>
<td>1992</td>
</tr>
<tr>
<td>Area:</td>
<td>106 m²</td>
<td>1.100 m²</td>
<td>210 m²</td>
</tr>
<tr>
<td>Area in use:</td>
<td>130 m²</td>
<td>461 m²</td>
<td>146 m²</td>
</tr>
<tr>
<td>Places to let:</td>
<td>4</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Average numbers of tenants:</td>
<td>3</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Managing organizations:</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

The main objectives:
- promoting the economic development of Zala county,
- supporting the establishment and sustainability of micro-, small- and medium-sized entrepreneurs,
- providing services.

Incubator program

The incubator program - that has started in Zala County in 1995 - helps the start-ups, mainly the ones which are deficient in funds, by providing a favourable property-rent and other connecting services.
There are rooms for 16 enterprises in Lenti. Over and above that there is a meeting-room of 45.6m² that is equipped with the technical instruments necessary for trainings and distant teaching. From 2002 a video-conference meeting-room is available as a new service. The operation of the incubator is managed by the Lenti sub-office of Zala LEA settled in the institution.

The favourable room-rent is assured for 6 enterprises in Zalaszentgrót, which are equipped with all the necessary infrastructures. Mainly the enterprises of servicing and handicraft activities are settled in the incubator.

**Foundation of Business Development in Szombathely and Vas County, Enterprising Centre**

Address: 1/b Petőfi Sándor str. 9700 Szombathely Hungary

Date of Establishment: 1993  
Area: 2.300 m²  
Area in use: 955 m²  
Places to let: 16  
Average numbers of tenants: 14  
Managing organizations: 5

**Introduction**

The Foundation of Business Development in Szombathely and Vas County was established in 1993. The foundation members are: the Hungarian Foundation for Enterprise Promotion, Municipality of Szombathely, banks, economic organizations and self-entrepreneurs.

The Enterprising Centre started to operate in Szombathely in 1994 in order to develop SMEs through national and PHARE CME projects.

**The Enterprising Centre aims to:**

- to develop business culture,
- to increase competitiveness,
- to provide information services,
- to develop own services within the Centre
III.3.4. Research institutes

Features of the Research Sites

Number of the research sites performing R&D activity slightly increased in the last two to three years in the region, amounting to 210 by 2006. At the same time, this 8% increase somewhat lags behind the countrywide average and this is the reason why position of the region as regards to number of the research sites is unchanged. Looking to the absolute numbers only Northern Hungary and Central Transdanubia lies behind, while the same values calculated on a per capita basis show a somewhat more advantageous picture, as the Northern Great Plain figures are also exceeded then.

Though the number of research sites has been doubled during 10 years, share of the region in the countrywide figure is actually the same, notwithstanding the higher differences seen in some of the years; this share is 7.5% in 2006, the same as it was in 1996. As regards the number of research sites, we can witness an extremely balanced development in the last 10 years. The number of research sites flared to the same extent in almost all regions (from 75 to 95 per cent), which resulted in fair constancy of the former regional difference figures. It was only the Central Transdanubian region that could produce a salient growth compared to the tendency (190 per cent) which, however, was just enough to catch the last but one place.

Progress of the number of research sites

<table>
<thead>
<tr>
<th></th>
<th>Number of research sites</th>
<th>% Share from the countrywide number, %</th>
<th>Number of research sites per 100,000 inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Győr-Moson-Sopron</td>
<td></td>
<td>125</td>
<td>109</td>
</tr>
<tr>
<td>Vas</td>
<td></td>
<td>39</td>
<td>45</td>
</tr>
<tr>
<td>Zala</td>
<td></td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>West Transdanubia</td>
<td></td>
<td>194</td>
<td>188</td>
</tr>
<tr>
<td>Central Hungary</td>
<td></td>
<td>1255</td>
<td>1204</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td></td>
<td>158</td>
<td>161</td>
</tr>
<tr>
<td>South Transdanubia</td>
<td></td>
<td>227</td>
<td>206</td>
</tr>
<tr>
<td>North Hungary</td>
<td></td>
<td>145</td>
<td>141</td>
</tr>
<tr>
<td>North Great Plain</td>
<td></td>
<td>280</td>
<td>300</td>
</tr>
<tr>
<td>South Great Plain</td>
<td></td>
<td>282</td>
<td>316</td>
</tr>
<tr>
<td>Hungary</td>
<td></td>
<td>2541</td>
<td>2516</td>
</tr>
</tbody>
</table>

Source: Grosz (2008) based on KSH (Central Statistical Agency) data
We can observe a somewhat more favourable tendency, if we examine the number of research topics or development projects cultivated or worked on in the region. In the last two years, numbers of R&D topics and assignments have increased by 20% in the West Transdanubian region compared to the 9% countrywide figure, which is mainly due to the higher dynamics of the Vas and Zala county processes. As a result, share of the three counties from the countrywide figure has increased from 7% to 7.7%, which means a stable forth place for this region, right behind Central Hungary and the two regions of the Great Plain; and if we compare these figures on a ‘per inhabitant’ basis, only the Central Hungarian region (also including the capital) has higher figures. In the last 10 years we could see a countrywide average growth of 55%, while the number of R&D topics and assignments has increased by as much as 137%, which represents the highest growth rate.

Territorial differences in the region have slightly decreased in the latest few years, however, they’re still extremely significant. As regards the territorial distribution of research sites, the weight of Győr-Moson-Sopron county decreased from the 65% figure in 2004 to 60%. Similar processes take place with respect to the distribution of research themes and development projects, too, where share of Győr-Moson-Sopron county has been fallen from the dominant 68% figure to 61%, which still ensures a determining position for the county. The two other counties have nearly the same significance with respect to R&D themes and assignments, while Zala is obviously the most underprivileged in this respect.

Most important primary host institutions for the research sites continue to be the institutions for higher education, especially the two university centres in Győr-Moson-Sopron county (University of West Hungary and Széchenyi István University), whose significance may be enhanced by the strengthening of KKKs (Co-operation Research Centres) and RETs (Regional Knowledge Centres). Role of the academic institutions is marginal, especially in the area of technical sciences, while the number of industrial research sites is also low (though an increasing number of multinational companies and local SMEs realise the significance of R&D).

In the last two years (just as in the previous 10 years) it was the West Transdanubia Region that was able to increase the total number of R&D personnel with the highest extent - this rate of increase (95 per cent) was three times the same figure for the countrywide average. Corresponding to this dynamics, the share from the countrywide figure increased from 3.5% in 1996 to 5.2% in 2006, which is still terribly lagging behind either the relative weight of the region based on the population or the earlier R&D figures, not even mentioning the economic potential of the region. Despite this growth, with the employees numbering 2625, only the 6th place could be reached by the region before North Hungary, and even its population-based figure is not better than fifth in the ranking.

If we look only at numbers of researchers and developers instead of the total number of people employed in R&D, we can see early the same picture. Direct R&D number has grown to the highest extent the last two years and the 10 years’ figure of the region could only be exceeded by Central Transdanubia, a region also coming from very low. In spite of this, though the nationwide weight of West Transdanubia grew from 4% to 5.5% compared to 1996 (from which growth more than half per cent happened in the last two years), just as in
the case of the total R&D numbers, this region continues to take the 6. place among the Hungarian regions (5th place if we compare on a population basis). Of course, total number of employees in the R&D field shows a territorial distribution, which reflects territorial concentration of research sites and research topics, this is why Győr-Moson-Sopron county plays a determining role in this respect.

Ratio of the number of people in research and development to the total R&D employee number is 68.4% for West Transdanubia, which is the highest figure in Hungary and exceeds even that of Central Transdanubia, which is unambiguously the leading region in the research/development field. The picture is even more interesting when looking at the research/developmental employee number per one research site. In the last ten years, number of research sites and employee number have grown to the same extent, so there were no significant change in this respect, this value was quite constant at around 12-13.

Number of people in research and development as a function of time

<table>
<thead>
<tr>
<th>Region</th>
<th>R&amp;D number</th>
<th>% Share from the nationwide number, %</th>
<th>R&amp;D number per 100,000 inhabitants, persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Győr-Moson-Sopron</td>
<td>1015</td>
<td>1087</td>
<td>1216</td>
</tr>
<tr>
<td>Vas</td>
<td>334</td>
<td>312</td>
<td>417</td>
</tr>
<tr>
<td>Zala</td>
<td>151</td>
<td>151</td>
<td>162</td>
</tr>
<tr>
<td>West Transdanubia</td>
<td>1500</td>
<td>1550</td>
<td>1795</td>
</tr>
<tr>
<td>Central Hungary</td>
<td>17535</td>
<td>18262</td>
<td>18986</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>1712</td>
<td>1689</td>
<td>1849</td>
</tr>
<tr>
<td>South Transdanubia</td>
<td>2405</td>
<td>2444</td>
<td>2472</td>
</tr>
<tr>
<td>North Hungary</td>
<td>1571</td>
<td>1580</td>
<td>1614</td>
</tr>
<tr>
<td>North Great Plain</td>
<td>2873</td>
<td>2848</td>
<td>2968</td>
</tr>
<tr>
<td>South Great Plain</td>
<td>2824</td>
<td>3034</td>
<td>3102</td>
</tr>
<tr>
<td>Hungary</td>
<td>30420</td>
<td>31407</td>
<td>32786</td>
</tr>
</tbody>
</table>

Source: Grosz (2008) based on KSH (Central Statistical Agency) data

At the same time, quite a significant decrease of this figure can be seen for the other regions, allowing the conclusion to be drawn that numbers of research sites grew more dynamically than those of employees. Numbers that were earlier around 20-25, have decreased to 14-18 everywhere, while in the Central Transdanubia region it has fallen to 21.1 from the previous 30.5 value, which can show a frittering of R&D activities. Number of people in research and development per one research site is in accordance with the same process. Though the 8.5 value of the region is the lowest in the country, an unequivocal levelling could be seen in the last 10 years. While West Transdanubia produced the only increase in this respect, to 8.5 from
an even lower former figure of 7.6, there is a tendency of decrease in all other regions. Numbers around 11-12 in 1996 decreased to 9-10 by now.

Increase in the number of people with scientific degrees - though dynamically grown in the last two years as well - was especially significant in the year 2006, and this already amounted to almost 550, four times that of the 1996 figure. An equally significant index is the number of researchers with a DSc (academic doctoral) degree as a function of time: this index doubled during 10 years and by 2006 there were 80 so-called ‘high-level doctors’, who participated in research/development activities in the region. Both areas showed a growth that had the fastest dynamics in the country. Despite this tendency, the nationwide weight of the region in this respect is even worse than the R&D indices: 5.2% for CSc and PhD and 4.2% for DSc. This is enough in both categories for the 6th place in the ranking of regions.

The situation is only slightly better if we look at these numbers (people with any scientific degrees or with DSc degrees) in correlation with the population number: in that case the region takes the 5. position, before Central Transdanubia and Northern Hungary; although it’s likely that it takes a long time until West Transdanubia can compete in this respect with the regions accommodating traditional big university campuses. Existence of universities decisively affecting the number of qualified people is also apparent in the internal heterogeneity of the region. Values of Vas county significantly (at least twice) outnumbered by those for Győr-Moson-Sopron county, which, in turn, are four to five times higher than those of Zala county which is the most handicapped with regard to the higher educational structure. Moreover, differences inside the region have also been increased in the last two years.
III.3.5. Universities

Overview of Universities in West Transdanubia

The Széchenyi István University was founded in 1968 as the College of Transportation and Telecommunication. During the 1970s and 1980s, the institution strove to satisfy the need for polytechnic level engineering training in transportation and telecommunication.

After the change of the political system in 1990, the institution and its traditional training areas focussed resources on meeting the labour expectations of the prosperous economy of the region and the demands of the multinational companies which had settled in the region. Since 2002, the institution has been operating as Széchenyi István University with three faculties: the Faculty of Engineering Sciences comprises the Institute of Built Environment and Transport and the Institute of Informatics, Electrical, and Mechanical Engineering. The Faculty operates the Interdisciplinary Doctoral School of Engineering, Modelling, and Development of Infrastructural Systems.

The Regional University Knowledge Centre for Vehicle Industry and the Cooperative Research Centre for Automotive, Electronics, and Logistics are both run within the Faculty of Engineering Sciences. Both of them deal very well with the special needs of the regional economic demand for qualified human capital, and the university has very strong relationships with the business sector. This is still unusual for Hungary.

From 2007, the former Faculty of Law and Economics was branched to the Faculty of Law and Political Sciences, and the Faculty of Economic Sciences. The two social science faculties operate the Doctoral School of Regional and Economics Sciences the and Doctoral School of Law and Political Sciences instead of the former multidisciplinary doctoral school.

Besides Széchenyi István University in Győr, the University of West Hungary is the other university centre in the region. After several changes the present University of West Hungary started functioning on January 1, 2000. It was actually a result of a merger between

Western Transdanubia has 3 higher education institutions which is established in the region, are as follows:

- Széchenyi István University in Győr: 2 faculty and 2 Institute
- Papnevelő Institute for Theological College of Győr: 2 department
- University of West Hungary, Sopron: 10 faculty

Berzsenyi College in Szombathely works under the name Savaria University Center of University of West Hungary from 2009, with 3 faculty.

Georgikon Faculty in Keszthely belongs to the Pannon University of Veszprém.
Now it has ten faculties of Sopron University, four of them in Sopron, which is also the centre of the university, one in Győr and one in Mosonmagyaróvár, three in Szombathely and finally one outside the region in Székesfehérvár. The University of West Hungary considers itself as a «green university» which endeavours to create the skills necessary to conserve and improve ecological, economical, and socially adaptable methods so as to provide a sustainable development of the quality of life and mankind.

The university offers several doctoral schools.

The Faculty of Forestry includes the Environmental Resource Management and Protection Cooperation Research Centre, while the Faculty of Wood Sciences contains the Regional University Knowledge Centre for Forest and Wood Utilisation. Both of them have strong business relationships especially with firms in the wood and furniture industry, and in the renewable energy sector. Besides these centres, the university operates several laboratories which support R&D activities.

In the Mosonmagyaróvár Faculty, there is significant R&D capacity in agriculture and food processing.

However, changes are continuing. In January 2007, the University of West Hungary and the Berzsenyi Dániel College in Szombathely decided to merge and establish a new joint university, which is expected to operate from 2009.

Berzsenyi Dániel College in Szombathely is one of the largest colleges in Hungary and plays a significant role in the higher education system of Western Transdanubia. With a history of over 50 years, higher education in Szombathely has provided tens of thousands of highly trained professionals in the fields of education, science, and public administration alike. In its beginnings, the college focussed on elementary teacher training. Over the last few decades, the original profile has been continuously upgraded with new courses, and more than ten university level training programmes have been recognised. Its departments and scientific teams have established cooperation with various colleges and universities within Hungary and abroad. The infrastructure of the college is being constantly expanded and updated. Its research activity focusses on social sciences, so R&D activity is relatively limited.

The Pannon University was founded in 1949 in Veszprém, and located in the neighbouring region. However, the Georgikon Faculty of Agriculture of the University is situated in the town of eszthely in West Transdanubia. Georgikon, the first regular agricultural higher education institution on the Continent of Europe, was founded in 1797. The Faculty provides graduate and postgraduate education including B.Sc., M.Sc., and PhD courses and carries out high quality research related to agriculture. It carries out extensive research work in the fields of plant protection, plant variety selection and maintenance, crop production, animal breeding and nutrition, farm management and economics. The Faculty supports a wide range of international relations, both in the form of joint research projects and in informal scientific cooperation.
Besides the largest university centres of the region, there are several other higher educational institutions in Zalaegerszeg, Szombathely, and Nagykanizsa, which are local units of different universities and colleges seated outside the region.

- The Zalaegerszeg unit, the College of Finance and Accountancy, was established in 1971 and now is part of the Budapest Business School.
- The Faculty of Health Science at the University of Pécs also has educational units in Szombathely and Zalaegerszeg.
- The Budapest University of Technology and Economics runs an outside unit in Zalaegerszeg with engineering sciences.
- And finally, the Pannon University has a higher educational unit in Nagykanizsa.

The activity of these outside units focuses on teaching. Their R&D performance is thus very limited.
III.3.6. Special innovative schemes

Péter Pázmány Programme - Regional Knowledge Centers (RKC)

The main goal of the Péter Pázmány Programme is to establish Regional Knowledge Centers (RKC) to exploit research and development results in close cooperation with the industrial sector.

The aim of the programme is to establish professional and regional centers of excellence in cooperation with companies and other research organizations to manage innovative projects, focused on research and development at an international level. These research centers effectively cooperate with the industrial sector, stimulate the technological and economical development of the regions.

The task of the supported Knowledge Centers is to transfer R&D results to marketable new products and technologies.

1. Objective of the Call

The overall objective of this programme is to promote the establishment of world leading scientific and technological university innovation centres university named Regional University Knowledge Centers in order to establish professional and regional centers of gravitation that perform outstanding research and development activity and technological innovation, strongly cooperate with the industrial sector, stimulate the technological and economical development of the given region, thereby improving the competitiveness of the country.

2. Activities eligible to be supported

Within the programme, grant can be provided to the following activities:

a) R&D activities and activities exclusively related to R&D support (individual activities excluded)
   - basic research;
   - applied research, as well as technology transfer and innovation closely related to applied research;
   - participation of university and PhD students in R&D, educating a new generation of young scientists;
   - refreshing education of teachers, researchers and industrial specialists;
   - services related to R&D and innovation;
   - presentation of schemes, strategies, studies and analyses serving for the basis of R&D and innovation activity of the Knowledge Centre;
- encouraging the establishment of spin-off and start-up companies in order to exploit R&D results;
- supporting the registration of intellectual property rights (patents, prototypes, trademark and design applications), except for enterprises;
- demonstration and presentation of R&D results at conferences and exhibitions concerning innovation;
- organization of scientific conferences and other professional meetings;
- domestic and international mobility of participants, exchange of experience;
- international cooperation in science and innovation
- participation in international research and technologic development programmes and competitions
- surveying the R&D and innovation development possibilities of the regions, seeking for partnership relations,
- using consultancy relating to law, industrial property rights, innovation and technology transfer.

b) Investment activities related to R&D support

The investment activities are allowed to be related exclusively to some research and development program; therefore, the intensity of supports relating to the research and development and the range of accountable cost, respectively, shall be used.

- Construction, purchase, reconstruction or renovation of buildings and laboratories, necessary for the operation of Knowledge Centres, research and development and the innovation activities.
- Purchase of scientific tools and equipment serving for research and development purposes;
- establishment of pilot systems and test environment;
- purchase of software, third party licenses and know-how

National Office for Research and Technology announced a call for proposals in October 2004 for the first time to establish and support the operation of Regional Knowledge Centers.
**Supported Regional Knowledge Centers 2006**

<table>
<thead>
<tr>
<th>University</th>
<th>Region</th>
<th>Title of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Pannonia</td>
<td>Central - Hungary</td>
<td>Research and Development in the Foodchain Regional Science Center</td>
</tr>
<tr>
<td>Corvinus University of Budapest</td>
<td>Northern - Great Plain</td>
<td>FOOD-ENERG Regional Knowledge Center</td>
</tr>
<tr>
<td>College of Nyiregyháza</td>
<td>Central - Hungary</td>
<td>Cellcommunication Knowledge Centre</td>
</tr>
<tr>
<td>Eőtvös Lóránd Science University</td>
<td>Central - Hungary, Central - Transdanubia</td>
<td>Dunaújváros Regional Material Science and Logistics Knowledge Centre</td>
</tr>
<tr>
<td>College of Dunaújváros</td>
<td>Central - Hungary</td>
<td>Transportation Informatics and Telematics Knowledge Center</td>
</tr>
<tr>
<td>Budapest Tech Politechnical Institution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Supported Regional Knowledge Centers 2005**

<table>
<thead>
<tr>
<th>University</th>
<th>Region</th>
<th>Title of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budapest University of Technology and Economics</td>
<td>Southern - Great Plain</td>
<td>IT Innovation and Knowledge Center</td>
</tr>
<tr>
<td>University of Szeged</td>
<td>Southern - Transdanubia</td>
<td>Environmental- and Nanotechnology RSC: development of integrated systems for the improvement of the quality of human life</td>
</tr>
<tr>
<td>University of Pécs</td>
<td>Western - Transdanubia</td>
<td>MEDIPOLIS South-Transdanubian University Innovation Knowledge Center for Developing Life Quality Improving Medicines and Methods of Treatment</td>
</tr>
<tr>
<td>Széchenyi István University</td>
<td>Central - Hungary</td>
<td>University-based Regional University Knowledge Center for Vehicle Industry</td>
</tr>
<tr>
<td>Eőtvös Lóránd Science University</td>
<td>Central - Hungary</td>
<td>E-Science Regional University Knowledge Center</td>
</tr>
<tr>
<td>Szent István University</td>
<td>Northern - Hungary</td>
<td>Regional University Center of Excellence in Environmental Industry Based on Natural Resources</td>
</tr>
<tr>
<td>Eszterházy Károly College</td>
<td></td>
<td>EGERFOOD - Consumer focusing complex traceability systems, new food safety parameters and devices with new info-communication system</td>
</tr>
</tbody>
</table>
Supported Regional Knowledge Centers 2004

<table>
<thead>
<tr>
<th>University</th>
<th>Region</th>
<th>Title of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Debrecen</td>
<td>Northern - Great Plain</td>
<td>High-technologies around the University of Debrecen</td>
</tr>
<tr>
<td>University of Szeged</td>
<td>Southern - Great Plain</td>
<td>Szeged Neurobiological Knowledge Center (DNT)</td>
</tr>
<tr>
<td>Semmelweis University</td>
<td>Central - Hungary</td>
<td>Szentágothai János Regional University Knowledge Center</td>
</tr>
<tr>
<td>Budapest University of Technology and Economics</td>
<td>Central - Hungary</td>
<td>Advanced Vehicles and Vehicle Control Knowledge Center</td>
</tr>
<tr>
<td>University of Miskolc</td>
<td>Northern - Hungary</td>
<td>Knowledge Intensive Mechatronical and Logistical Systems Regional University Knowledge Center</td>
</tr>
<tr>
<td>University of Western-Hungary</td>
<td>Western - Transdanubia</td>
<td>Regional Knowledge Center of Forest and Wood Utilization</td>
</tr>
</tbody>
</table>

In our region there were two Regional Knowledge Center established under the support of National Office for Research and Technology:

- Regional Knowledge Center of Forest and Wood Utilization, Sopron, University of Western-Hungary
- University-based Regional University Knowledge Center for Vehicle Industry, Győr, Széchenyi István University
III.3.6.1. ERFARET Regional Knowledge Centre of Forest and Wood Utilization

Aim and motivation:

The aim of the Forest- and Wood Utilization Regional University Knowledge Centre (RET) is to raise the level (that was extraordinary so far) of the sylviculture and wood products industrial activity of the West-Hungarian region, throughout technological and economic support and development of the region and improving the competitiveness of the region and the country.

Strategic aims and their fitting into the Regional Development Plans

The center task was to create a scientific and technological innovative centre (based on network principle), carrying out innovation and research-development (R+D) activities that are extraordinary in the region. The centre will effectively and intensively cooperate with the economic sphere, as a professional and regional centre. Among the strategic aims, the knowledge centre, the level of the innovation ability, the modern technology, supportive cooperation between the intensive wood processing industry and the forest management, the development of small and medium ventures (KKV) in the region, has to be mentioned. All these correspond to the aims of the Economic Competitiveness Operative Programme (GVOP) of the National Development Strategy (NFT).

Links to the industrial and higher educational background of the region:

The wood, the timber is one of the largest and most valuable natural resources of the Pannon region, which traditionally determines the character of the landscape. The forest rate in the region is significant, the necessary basic materials can be found in large quantity and good quality, the determinant companies of the wood products industry (with great traditions) are concentrated in the whole spectrum of the wood utilization. The analyses, carried out for the development plans, determined the utilization possibilities of the region in the integration of economical networks, which are based on product clusters.

The scale of participation in the education of the recipient - the University of West-Hungary - is determinant in the operation of the knowledge centre. The role of the centre (within the university) is determined by the ambition, that during its operation, research and development (R+D) projects can be materialized, that satisfy the special demands of the sections, having strategic importance (sylviculture and wood- and furniture industry). That issue significantly raises the value of the research and development and educational-training activity on the university. For the students, it also means a practice-oriented educational form, which cannot be attained on a different way.

The recipient - the University of West- Hungary - is a unique national institution, both from educational and scientific aspect, because it has national authority. That is why, the
knowledge, established by the Regional University Knowledge Centre has to appear nationwide both in the R+D activity and in the education. It means several advantages and task that the Knowledge Centre aligns on the Vienna-Bratislava-Budapest innovation axis, which makes possible to build up a comprehensive international cooperation next to the borders.

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The knowledge centre (consortium) was formed in the course of the University of West-Hungary has 13 participants. The dominant sylvicultural and wood industrial companies, Ltds, individual ventures of the region, were among them. The consortium was opened for new collaborators. Without research results, there is no real, up-to-date improvement, but without requiring development demands, the research will not be continued. Stopping the research will result in the decrease of the level of the education.

Establishing the knowledge centre was created the possibility to estimate the development demands, required by the practice and serve these with research results. They made an attempt, with synthesizing and integrating the knowledge base (professional level, experience) of the participants of the consortium to achieve results, that are new, significant, and useful in the practice and these results should promote the development of the region. It was not sufficient to achieve these results with independent, isolated work of the partners nor financially, neither on the side of trained human resources.
In the course of RET objectives as follows are outlined:

- Determining the aims together
- Holding the material and intellectual resources together
- Accomplishing the R+D tasks, we expect significant results that will be directly and quickly utilized - throughout the consortium members – and the partners involved, being interested in the topic.

As a result of the comprehensive R+D work, an active contact could established between the recipient university and the business sphere, that catalyze:

- Materialization of mechanical-technical innovations,
- Improving the level of researches,
- Improving the level of education, required to meet the demands of the labour market

Tasks follow from the foregoing:

- to create the coordination of the research and development components of the activity, carried out in the knowledge centre,
- to organize the economic utilization of the R+D results, accomplished in the course of the RET
- to increase the efficiency of the educational (PhD, postgraduate and regular student) activities (dissertations, Scientific Student Club essay, diploma works)
- to found the short- and long term utilization of the results of student works and lecturers activities in the RET, but above all, we have to make them accessible.
- to found the efficiency of the activities (for the consortium, town and the region), carried out in the Knowledge centre
- to provide the legal handling of material and financial tools, used by the RET.
- to found the sustainability, enlargement, financial improvement and development of the RET (after 4 years)

It is essential for the aspect of the Regional Knowledge Centre of the Forest and Wood Utilization, that the Sopron Municipality provided for the university places (as a renting possibility) in the Innovation Centre and Incubator house in Sopron. The spectacular building, its name, and its allocation in the Industrial Park, means symbolically, that all this is about a novel organization.
The Regional Knowledge Centre of Forest and Wood Utilization (ERFARET) launched by the University of West Hungary closed successfully its four years project (2005-2008) together with the twelve partners in the consortium. In frame of the four sub-program of the “Regional development of forest management” program and the five sub-program of the “Regional development of lumber utilization” program, according to the regional character of the activity, the economic development effect predominated mainly in the strategically important forestry and wood industrial sectors of the area, through the R&D activity of the knowledge centre considering the special development demands of the sector. During the project, nearly 0.8 million euro was activated as a contribution of their partners cooperating such companies like the Kisalföld Forestry, Kiskunság Forestry and Wood Industrial Company, FALCO Chipboard Manufacturing Holding and the Bakonyerdő Forestry and Wood Industrial Company.

If anybody can take a look at the last four years, in many aspect of the history of the University of West Hungary, developments are discovered due to the RET-03/2004 project realized in frame of the Pázmány Péter Program. The most evident is the high level infrastructural and instrumental development that was indispensable to achieve new, high quality research results, for example the CG-MS mass spectrometer, the gas chromatograph, the electron microscope, the wildlife biology research centre at the Fertő Lake and the hydrology-monitoring research catchment at Hidegvíz-valley. The high level cooperation, the new partner network and the research results utilized at the partners are such factors that substantiated the further function of ERFARET on the whole. It is a good evidence to support this statement that their extant and new partners will provide the out source of the three years project that will be launched in frame of the GOP-2008-1.1.2. tender.

Because of the features of the forestry and wood industry, their research results were delivered to the concerned partner through the assign of the know-how. Such processes are for instance the chemical treatment technologies where from the view point of environment protection and economy, optimal processes can be developed using well known chemicals, moreover the game management technologies allowing for example a healthier game feeding. There are researches that have strategic importance from a forestry point of view but its results will be tangible only after 15-20 years during the realizing of the new forest stands. A good result for this is the research dealing with selective forests under the sub-program 1.2. After a long period, the university has been started its first patent announcements (VÍZÖNTŐ prompt impact mobile forest fire extinguisher, determination of low quality log selections volume using photo analytical method, timber storage in airtight closed foil and vacuum, soil injection machine, process for sawing optimization, new adhesive for wood industry, process
for nano-layer adsorption in paper industry), their utilization and marketing means brand new challenges both for the university and the ERFARET.

As a result of their activity, the FAIMEI Material and Product Testing Laboratory, the Taschner Acoustic Ltd., the private enterprise of Gábor Szabó forest engineer PhD student and the private enterprise of Attila Tari form and product designer MSc student was established.

It is considered to be an important achievement that the ERFARET became the most significant unit in the technology transfer processes of the UWH, undertaking this huge competence requiring role. Establishing the PATLIB Centre, the educational and disseminating activity, the human resource training of the knowledge centre on the field of project management and industrial right protection support the ERFARET to be the technology transfer unit of the UWH in the future, too.

The year 2008 was the year of the gradual transformation. One of the most important phase that the NymE-ERFARET University of West Hungary Knowledge Centre of Forest- and Wood Utilization Nonprofit Ltd. was established. The available examination instruments along with the equipments, lab facilities and the extant specialized knowledge offer the possibility for the ERFARET to provide valuable services for the industry, to carry out joint R&D activities with additional partners and to initiate their sub-projects that will result in innovative products and technologies and hereby will guarantee long term incomes for the University of West Hungary and the Knowledge Centre as well.

**Educational and training program – knowledge transfer**

**Education and training**

In the year 2008, altogether 89 students participated in the ERFARET researches. It is considered strategically important henceforward to promote research works of students and PhD students as well as PhD trainings in the aspect of knowledge and technology transfer. The education of the intellectual property protection was started at the University of West Hungary in frame of an agreement with the Hungarian Patent Office (HPO). The PATLIB centre latched on to the education as well through the training of exploration in the industrial right protection database. In order to develop the innovation processes, trainings were organized in the topic of tender assembling and project management with the contribution of Laser Consult Ltd., NKTH (National Office for Research and Technology), NYDRFÚ (West Pannonia Regional Development Agency) and TEMPUS Public Foundation.

It was organized a conference in frame of the first “innoLignum Sopron 2008” exhibition with the title of “Innovation and tradition in the forestry and wood industry – 200 years of the forestry higher education”.
Marketing

It is considered to be important that the ERFARET image became a recognizable identification sign of the high quality research. The acquirement of the “knowledge-marketing” activity and the introduction of the name “ERFARET” for forestry and wood industry enterprises was an important task of the four year period. Today, the University of West Hungary can start an enterprise with a well grounded name. By the regular appearance in articles, well constructed presentations, controlled and market close communication style, the form of a new scientific and professional existence of forestry and wood industry is outlining for the entrepreneurs personalized by ERFARET. There were numerous national professional exhibitions (Pannon Design, Ligno Novum - Wood Tech, innoLignum Sopron) that are always useful events for communication and experience exchange.

![Graph showing number of scientific publications from 2005 to 2008](image)

Number of scientific publications from 2005 to 2008

IP activity

The PATLIB Centre was founded in 2007 in Sopron by the UWH and HPO to provide counsel in intellectual property (IP) protection. The PATLIB Centre in coordinated by the ERFARET. Based on the inquiries ratio reflecting last year’s experience, it is clear that the technological creations (patent, utility model) are dominant. Clients are mainly university researches and students. Their experiments show that at least 50 % of the ideas disclosed in the course of inquiries could be utilized in some way (patent, utility model, know-how agreement). This points out relevant marketable intellectual capacity. Out of the inquiries, one student submitted design patent announcement, one client utility model announcement and one client public trademark announcement with their guidance.
Patents, utilizations

After the patent announcement of VÍZÖNTŐ (prompt impact mobile forest fire extinguisher working with high pressure water, suitable for initial forest fire extinguishing) in 2006, the ERFARET entered into a utilization contract with the MGT-2000 Ltd. in 2007. As a result of this contract, license charge has been realized based on five sold machinery this year. After the announcement of the process named “Determination of low quality log selections (paper-, fiber- and firewood) volume using photo analytical method” developed under the 2.1. sub-program, the researcher team was assigned by their industrial partners to further develop the method. Industrial experiment of the patent named “Timber storage in airtight closed foil and vacuum” has been started at the KARDEX Ld. The self-cost calculating program module for company control system developed in 2006 in frame of the 2.5.1. sub-task was successfully utilized by one of their partners in the consortium called “Bakonyerdő Zrt”. As an outcome, the research team has new industrial orders. We are going to start IP process in case of the following four topics: soil injection machine, process for sawing optimization, new adhesive for wood industry, process for nano-layer adsorption in paper industry.

Spin-off and start-up enterprises

Between September, 2007 and January, 2008, a survey and a study were prepared by the colleagues of ERFARET entitled “Enterprises in the environment of the University of West Hungary”. It has the aim to identify the spin-off and start-up enterprises, to define their situation (how close is their activity to the UWH), to discover, who are establishing enterprises, what are the setback factors hindering the establishment of an enterprise and the potential possibilities at the university. In cooperation with the Laser Consult Ltd, a spin-off enterprise establishing and mentoring program model was prepared based on the allocation environment of the UWH. The results disclosed several problems:
Plans

In 2008, the staff members of the ERFARET Centre worked out how could be the organizational unit of the University of West Hungary transformed into an enterprise. As a result of their proposal, the UWH established the NymE-ERFARET Nonprofit Ltd. in autumn 2008. During the operation of the Ltd., their training programs for the development of the innovation processes would be repeated from time to time as a complementary education at the university. Also, their aim is to organize intellectual property management trainings for the university employees. In order to achieve their joint aims with the UWH, there were submitted two tenders under consideration (TÁMOP-4.2.1. and INNOREG „Spin-off”).

During the year 2008, a conception was elaborated by the ERFARET to develop the uniform technology transfer system of the UWH. Important part of this concept that the ERFARET will continue its work as a nonprofit company providing the services of an efficient project management and technology transfer office. The basic principle of the conception is the organizational and operational principle of the KTH Innovation (technology transfer organizational unit of the university) and the KTH Holding AB (project management companies, spin-off companies, incubation enterprise and technology transfer enterprise) worked out by the KTH (The Royal Institute of Technology, Stockholm). The conception was accepted by the UWH and the tender “TÁMOP-4.2.1.” was submitted based on their suggestion. The foundation of the Ltd. with 100 % ownership of the university was approved by the senate in July 1, 2008, thus the NymE-ERARET Nonprofit Ltd. was established in September 24, 2008. Until the end of 2008, three tenders were submitted by the Ltd. or with the cooperation of the Ltd. (INNOREG – Spin-off enterprise development mentor program, INNOREG – Product, technology, service innovation program with a local winery, GOP-2008-1.1.2. Development and reinforcement of the NymE-ERFARET Nonprofit Ltd.), moreover the Ltd. takes in research activities of several “INNOCSEKK Plusz” tenders.

For the long term subsistence, the Ltd. wants to achieve permanent results next to the professional R&D project coordination through satisfying the increasing demand for IP tasks, license trade and technology transfer. Therefore, the continuous development of the human resources is managed carefully to edify an appropriate professional generation.
III.3.6.2. JRET

The R&D Projects of István Széchenyi University and the Regional University Knowledge Centre for the Vehicle Industry

Cooperative Research Centre for Vehicle Electronics and Logistics

The Cooperative Research Centre (KKK) for Vehicle Electronics and Logistics started its operation on 1st November 2004, as a result of a successful GVOP (Economic Competitiveness Operational Programme) application. The contract for research between the Agency for Research Fund Management and Research Exploitation and the University was concluded on 6th April 2005. The project for 2005-2007 received a grant of HUF 400 million, which was supplemented by company project costs amounting to HUF 465 million. The KKK consortium was formed by three institutes of higher education, an MTA (Hungarian Academy of Sciences) institute and 23 companies. The project was successfully completed in 2007, and was included in the NFÜ (National Development Agency) publication entitled „The Seventy-Seven Most Successful EU Projects in 2007“.

The main research direction of the project was vehicle manufacturing processes, electronic controls and test procedures, process modelling and computer simulation, regional and international economy, as well as infrastructure development. The partner companies were the followings: Ajkai Elektronikai Kft., Állami Autópályakezelő Kht., AUDI Hungária Motor Kft., Bakony Művek Rt., Budapesti Közlekedési Vállalat Rt., EMAB Mélyépítő Rt., Folyami Hidalapozó Kft., GM Powertrain - Hungary Kft., Győr Megyei Jogú Város (Győr Town of County Rank), HBM Hidépítő-Soletanche Bachy Mélyalapozó Kft., Hidépítő Rt., H-TPA Kft., Hydro-Aluminium Győr Kft., Lear Corporation Hungary Autóipari Gyártó Kft., Magyar Suzuki Rt., Minor Rendszerház Rt., Philips Kft. Győr, Sapu Bt., Siemens Rt., Swietelsky Építő Rt., Szintézis Informatikai Rt., Útgazdálkodási és Koordinációs Igazgatóság (Directorate for Road Management and Coordination), VIADOM Rt.

Regional University Knowledge Centre for the Vehicle Industry

The Regional University Knowledge Centre for the Vehicle Industry (JRET) project operated with the support of the National Office for Research and Technology in the framework of the Péter Pázmány Program in the period from 2006 to 2008, and since then it operates as an independent organizational unit implementing new projects. The main activity of the Knowledge Centre is focused on the vehicle industry, within this priority is given to research into vehicle manufacturing technologies and assembly constructions. The Knowledge Centre acts as a centre for scientific and technological innovation, which in co-operation with the business sector operates an outstanding research-and-development network in the region, improving thereby the competitiveness of the country and the economic development of the
region. From 2006 to 2008 the consortium partners co-operating with the University were Rába Futómű Kft., Visiocorp Hungary Bt. and Borsodi Műhely Kft.

The grant of HUF 1.1 billion, awarded for an application, raised an additional HUF 713 million from company resources. Within the field of vehicle manufacturing technologies the three major research-and-development programs of the project were complex research into the manufacturing technologies and tools of high-quality vehicle parts, development of modern vehicle main units and research into their diagnostic procedures, as well as technology and knowledge transfer. The Centre established world-class research potential on the knowledge base of István Széchenyi University with 8 full-time researchers, the lecturers and PhD students of the University, as well as modern research tools. This enabled the consortium partners and the companies associated with the Knowledge Centre to develop and manufacture products that are competitive on the world market and have a high added value.

1. Mission Statement of the Regional University Knowledge Centre for the Vehicle Industry

The mission of the Knowledge Centre is to act as a centre for scientific and technological innovation for the vehicle industry in co-operation with the business sector, to operate an outstanding research-and-development network in the region, improving thereby the competitiveness of the country and supporting the economic development of the region.

The research infrastructure and human resources offered by the Knowledge Centre are available to every enterprise for the development, introduction of new technologies, and the creation of competitive vehicle products.

In the long term the organization intends to operate as a centre of excellence, playing a dominant role in vehicle development in the Austrian-Slovakian-Hungarian border region.

2. Overall Objectives (Strategy)

The Regional University Knowledge Centre for the Vehicle Industry meets the demand for research-and-development of the vehicle industry in the economic catchment area of Győr. Its concentration is outstanding on a national level, as 57% of those employed in the domestic vehicle industry work in the Central and Western Transdanubian Region, within this the activity of Győr-Moson-Sopron County in the vehicle industry is 4.7 times higher than the national average.

Internationally, the production of the Eastern-Central-European vehicle factories continues to increase. At the same time, a strategic rearrangement can be expected in the division of labour between the manufacturers of end products and the suppliers in favour of the latter, putting small and medium enterprises involved in the supply chain in an especially favourable position. With these trends of development, Győr and its catchment area can expect an even more dynamic growth, generating a significant demand for the R&D activity.
The Knowledge Centre, in line with the development of the regional and European vehicle industry, sees as its objective the enforcement of three key considerations, these are safety, environmentally-friendly operation and economically efficient manufacturing. The research into modern materials and technologies related to vehicle manufacturing, and the incorporation of the new solutions in mechanical constructions serve the achievement of these objectives.

The technology research for achieving the overall objectives covers the most important pre-production technologies and finishing processes used in the vehicle industry. From the primary forming processes the plastic forming of metals and the plastic parts manufacturing technologies play a significant role.

From the secondary processes the key fields are high-speed cutting, hard machining, as well as heat treatment and surfacing techniques. The research into the application of modern surface treatments concentrates primarily on tools. The research profile also covers the management of the whole manufacturing process, including the organization of production and logistics.

The researches related to construction include the theoretical bases for the development of vehicle assemblies and the concrete implementation of several prototypes.

Within this special attention is given to the research into the sizing of bearings and gearings, and the search for solutions resulting in minimal noise emissions. Assembly development focuses on new running gear solutions, their main fields of application are agricultural power machines and utility vehicles.

Computer simulation plays a key role in both the development of technologies and construction, it useful in both the modelling of technological processes and the solution of complicated flow and heat conduction problems. The application and further development of these techniques is the aim of the complex simulation laboratory implemented at the University, as well as the company laboratories, which represent a new quality in the development of technologies and the implementation of designed for manufacture constructions through the integration of the CAD, CAM and FEM procedures.

The strategic objective of the Centre is to establish world-class research potential in the outlined research field on the knowledge base of István Széchenyi University with 8-10 full-time researchers, the lecturers and students of the University, as well as modern research tools. This will enable the consortium partners and the companies associated with the Knowledge Centre to develop and manufacture products that are competitive on the world market and have a high added value.

In addition, one of the most important objectives of the Knowledge Centre is to have an emanating effect to promote education at the University and further training at the companies. Special attention is given to ensuring that the applied technologies, new procedures and instruments efficiently promote graduate, master and doctoral education, and that the scientific workshops provide an ideal framework for the fostering of young researchers. These
objectives related to university education are supplemented by high-level knowledge and technology transfer activities towards the companies.

3. Review of the 3 Years of Operation of the Regional University Knowledge Centre for the Vehicle Industry

Schedule for the achievement of the strategic objectives:
2006: competence development
– research infrastructure (technical and human resources)
– initial research results
2007: evolution of the project
– industrially utilizable results and new applications
2008: stable operation
– development of new procedures and equipment, introduction of new products into the market
– multiplicative effect: increase in the volume of attracted researches
– basis for the continued operation of the Knowledge Centre
2009-: development into a centre of excellence
– JRET becomes the scientific centre for the AutoPolis projects
– the continuation of researches with new grants for applications and orders from companies

The existence of Regional University Knowledge Centres established as a result of the Péter Pázmány Program promoted research activity in every field, and the achievement of numerous valuable results. The two Knowledge Centres for the Vehicle Industry, EJJT (Advanced Vehicles and Vehicle Control Knowledge Centre) operating at the Budapest University of Technology and Economics, and JRET established by István Széchenyi University, supplementing and mutually supporting each other, have become recognized research centres in the industry. The journal entitled „Automobile for the Future”, edited and published by them jointly, reaches every company in the vehicle industry, and provides a professional forum for sharing the innovative results of the industry.

In the three years the Knowledge Centre has become a dominant research base in domestic vehicle manufacturing. The research infrastructure and human resources of István Széchenyi University meet efficiently not only the demands of the consortium partners, but those of other companies in the vehicle industry as well. The new technologies, products, production and research tools created and introduced in the course of the implementation of the program have resulted in a concentration of knowledge that can continue to operate efficiently. Another outcome of the project is that the university researches have become much more result-oriented than before.

The new research project started in October 2008 is for purposeful, more focused development, based on the results of previous JRET research. Its implementation is guaranteed by a grant of HUF 906 million awarded for a National Technological Program application, supplemented by company resources amounting to HUF 450 million. In accordance with the conditions of the new application Rába Futómű Kft. is the leader of the consortium, and István Széchenyi University is responsible for managing the scientific programs. Other partner companies are Borsodi Műhely Kft. and HNS Műszaki Fejlesztő Kft. The implementation of the project started in October 2008 is in progress.

The engineering activity indicated as the research objective of the project belongs to the concept of Integrated Product Development. With its application competitive products and processes can be created, which enable our consortium partners to be successful in their business activities. The main characteristics of the research process are the followings:

- Vehicle manufacturing process and product innovation by relying on the most modern engineering development tools – computer aided design, manufacturing and quality management –, furthering the previous JRET results.
- Development and testing of models of the created complex innovation system for small, medium and large enterprises, and their transfer to a wide range of enterprises in the form of knowledge management know-how.
- Development of new products and services, using the development tools, based on realistic market demands in the following fields:
  - road vehicle and agricultural power machine running gears
  - precision tools and parts manufacturing for road/air vehicles
  - computer controlled measuring systems and quality control software
- Involvement of PhD students, post-doctors as well as young researchers in the researches at both the companies and the University. In addition, a key objective of the project is to foster a new generation of researchers by involving students educated at the University.

Other Company Researches and Applications for Grants

In addition to the presented major projects, the Regional University Knowledge Centre for the Vehicle Industry, as an independent organizational unit of the University, plays an integrating role in the organization of company researches and their coordination within the University. As a result, company researches in a value of approximately HUF 100 million are implemented annually. The knowledge gained from the previous KKK and JRET projects generated new applications by the Centre, a grant has already been awarded for an NTP application (INFCARE8) for the development of medical IT infrastructure, and several TÁMOP (Social Renewal Operational Programme) applications are awaiting a decision. From them the project focused on research into computer simulation should be mentioned.
III.3.7. Clusters

The European Commission Enterprise DG Promotion of Entrepreneurship and SMEs is improving business support measures Project Enterprise Clusters/Networks (2002) and the draft working definition is:

Clusters are groups of independent companies and associated institutions that are:
- Interdependent (this wording was not completely satisfactory, perhaps we could say alternatively: collaborating and competing);
- Geographically concentrated in one or several regions, even though the cluster may have global extensions;
- Specialised in a particular field, linked by common technologies and skills;
- Either science based or traditional.

The cluster has a positive influence on:
- Innovation and competitiveness;
- Skill formation and information;
- Further concentration and dynamics. (This needed refinement, new proposal: Growth and long-term business dynamics)

The first similar initiative in Hungary was established in West Pannonia. Its principle is the network-based organisation.

The following clusters work in the region nowadays:
- Pannon Automotive Cluster (PANAC ), 2000
- Pannon Wood and Furniture Cluster (PANFA), 2001
- Pannon Thermal Cluster (PANTERM), 2001
- Pannon Logistics Cluster (PANLOG ), 2005
- Pannon Textile Cluster (PANTEX), 2005
- Pannon Mechatronics Cluster (PANEL ), 2006
- Pannon Local Products Cluster (Handcraft Cluster), 2005
- Pannon Renewable Energy Cluster, 2006
- Pannon Pellet Cluster 2007,
- Pannon IT Cluster, 2007

These regional cluster organisations have received subsidies from the region’s extremely limited, decentralised funds. In West Transdanubia, all clusters have been developed by bottom-up processes.
Most of the largest companies are active in the key sectors mentioned above. The automotive industry includes: Audi, Nemak, Rába, BOS, BPW, General Motors, Sapu, Autoliv, LuK, and Sokoro.

In the electronics industry, the region has Provertha, Lite-On, Robust Plastic, Kromberg-Schubert, Delphi (Packard), Epcos, Jabil, and Villszöv.

Besides automotives and electronics, there are other machine industry firms: Cellcomp, Ipartechnika, Kühne, Mofém, Wahl, and DKG.

The wood and furniture industry is also very important with Velux, Lapcom, Ada, Kanizsa Trend, Swedwood, Interfa, Falco, Savaria Nett-Pack, Műbútor, and Zala Bútorgyár.

Traditionally, the textile industry has been strong in West Transdanubia. However, in the last decade its importance has declined owing to processes of globalisation, and most of the large companies have now closed.

The food industry is also a traditional industry of the region with Ceres, Győri Keksz, Pannon Baromfi, Pannon, Sága Foods, Heineken, Pannontej, and Zalabaromfi.

In addition to these sectors, the largest companies are in the construction and construction materials industry, in electricity, gas, water, other public utilities, transportation and logistics. The majority of these companies have their own R&D units and activities in the region, especially in the automotive and wood and furniture industries.

Strictly speaking of the clustering processes and clusters as ecosystems, we cannot talk about well working clusters in the West Transdanubia region. There are a number of fields and sectors (car industry, wood and furniture industry, tourism, etc.), at the same time, where a continuous progress of the clustering process can be observed and this can be a basis for these potential and politically directed pre-clusters to become by an active policy developing and well working clusters, even on middle term.

Though the region does not have an own solid and complex cluster policy, this deficiency is partly counterbalanced by the effect of the institutional, organizational and higher educational efforts to satisfy the special needs and demands of the pre-clusters established since 2000 (car industry, wood and furniture industry, thermal, mechatronics, logistics, textile industry, local products, renewable energy) or those of priority sectors as well as the effect of the innovation policy of the region.

Both the harder infrastructural developments and the softer developments of the human type are well connected to the key sectors that are able to exert a significant long-term effect on the economic-social development of the region. Due to the pre-clusters or services provided by them a continuous easening of the distract so characteristic of the Hungarian economic
players can be seen and there is a continuous expansion of both the formal and the informal relations among those players. It is ever more often that both the cluster organizations and the enterprises take part in international projects and their international relation network is continuously growing.

There are, however, also significant deficiencies beside the positive influences, or there are several external factors that is limiting and hindering the clustering process and implementation of cluster-oriented developments. Most important of these factors is probably the lack of decentralization, as a higher degree of decentralization could ensure the active participation of the local players in the decision-making processes, hence articulation of the local interests and emergence of developmental priorities.

Existing pre-clusters all struggle with serious financing problems; the management in most cases consists of one or two persons whose major activity, because of the lack of support, is gaining resources. This is the reason why operation of organizations often depends on projects useful in themselves but maybe farther from the original objectives and basic activity of the organization.

Most important basic tasks are often jeopardized by the low scant management, the continuous uncertainty, and the project-based financing, to this come providing of special services which are linked to membership fees or other allowances, that are ever more dominant because of financing issues and are nearly market based services. This is a further reason why existing organizations shift towards the membership focus, while a complex approach relying on every member and player of the clusters in the region is more and more overshadowed. Due to this, a majority of the initiatives can rather be interpreted as soft networks, though they call themselves a cluster.

In spite of the fact, that there is no uniform cluster-oriented policy to be found in West Transdanubia, both the processes going on in the region, and the planned developments point to something that can be understood as part of an organic evolutilional and economy-developmental strategy; a strategy by which the primary objective is unambiguously the realization and maintaining of a persistent competitiveness in the determining key sectors, by providing an appropriate regional business environment or innovative milieu. Hence what are central in order to help global competition of the industry sectors dominant in the region, are the special developments appropriate to the individual needs of the clusters, be they either special demands of the workforce market. R&D capacities, centres for innovation and competency, or coordination and growing of existing development organizations, which - as a whole system of elements - can now be regarded as a kind of cluster-oriented policy.

In the future, focus of developments and attention in the field of economy and innovation should stay by all means the clustering process and the small and medium size enterprises. An emphasized role should be given in the programs of innovation centres, cluster organizations and other players of the development to the improvement of innovative character of the SME sector, building their innovation capacity and supporting their innovative activities, in which process central role should be given to the cooperative relationships and the opportunity of

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mutual learning. Only on this basis can the region be able to increase share of the activities representing the higher added value and higher intellectual and knowledge part, which should dominate in the long run.

By launch of the Pannon Economic Initiative (unique in Hungary), by the formation of cluster organizations, by handing over of innovation centres and by beginning to fill them up with contents, as well as by the formation of the regional innovative agency and the regional innovative council, a network of institutions, an organizational framework system has been created in West Transdanubia. Financial possibility of a goal-oriented operation of this network of institutions, the utilization of resources with innovative purpose is created by a decentralized use of part of the Innovation Fund.
Present situation referring to services-activities, departments, networking, mediating role between academic and business community and strategy followed, types of financial support

In this respect, Hungary’s innovation system has some specific characteristics and some weaknesses that need to be addressed. A high share of R&D is financed from abroad and is concentrated in MNEs. Hungary is among the top OECD countries in terms of foreign funding of R&D, a confirmation of the importance of international linkages for the Hungarian innovation system.

While this investment has had significant positive spillover effects, Lengyel and Leydesdorff (2007) find that foreign-owned firms have had a “disturbing” effect on the patterns of interaction in Hungary by uncoupling more traditional medium-technology companies from their geographical roots. They view Budapest and the central region as the exception, as the level of system integration is much higher and interactions are much more intense. They conclude that Hungary does not have a coherent national innovation system but is characterised by three distinct regional patterns of interaction:

- The western part of the country, through its medium- and high-technology manufacturing base, is more integrated in the innovation systems of Austria, Germany and other EU countries.
- Budapest and its surrounding area compete with other metropolitan areas, such as Bratislava, Vienna and Munich.
- The eastern part of the country, with a relatively strong knowledge base stemming from the public research institutions, has the potential to attract medium- and high-technology sectors, but, as is typical of scientific institutes, linkages tend to be more internationally oriented.

The challenge is to ensure that the innovation system is not too “decoupled” and that public research institutes and enterprises are not remote from one another. The innovation and research capacities of Hungarian regions vary widely. The capital and the larger university cities, e.g. in Debrecen, Miskolc, Szeged, Pécs, Győr or Veszprém, possess the important research centres. With the exception of Budapest, the latter have not yet been able to become the centres of innovation in their respective regions.

Efficient consulting, innovation, bridging and technology-transfer institutions and their networks exist but are limited; it will be necessary to further develop knowledge transfer services.

Well-established links between scientific research and the innovation activities of enterprises are essential, especially for high-technology industries in which science-driven innovation is an important part of firms’ innovation portfolio. Close contacts between local public research facilities and MNEs also serve to better embed these companies into the national or regional innovation fabric. The flows of funding for R&D indicate that there is a quite substantial
share of research funding by enterprises at HEIs (mainly universities) and at PROs (mainly the Academy of Sciences), and that it has grown substantially over time. Only 4-5% of total higher education expenditures on R&D (HERD) was financed by firms in 2000-01, but the share climbed to 13% in 2006, a comparatively high figure in international comparison. Similarly, at 14%, the share of government intramural expenditure on R&D (GOVERD) financed by industry is higher than both the OECD and EU25 average, and lower only than those of Finland, the Slovak Republic, the Czech Republic and the United Kingdom.

*Firms collaborating on innovation with national partners as a percentage of all firms*

*Hungary vs. EU average, 2002-04*

Source: OECD 2008.

**Infrastructure for industry-science co-operation**

The two most important programmes on industry-science collaboration are the co-operative research centres (CRCs), which involve firms, publicly financed public research organisations and higher education institutions, and the regional knowledge centres (RKCs).

The co-operative research centres are a basis for the development of industry-science relations. They are established for a period of four years, with the possibility of renewal for a further three years, depending on the evaluation results. The 19 existing CRCs include approximately 300 enterprises and focus on breakthrough research in fields perceived to be of strategic importance for the innovation system. The research projects of the CRCs are assigned to departments or to partner research institutions to be performed by leading academics and researchers.

Another priority of the CRC is technology transfer, which includes adapting the results achieved in joint research projects for particular companies. The CRCs also offer services for setting up laboratories, purchasing new instruments, rental of R&D instruments and measurement services, etc. (NKTH, 2005). They also offer opportunities to students through...
their research activities as well as their education programmes. Owing to the low level of academia-industry co-operation in the regions, 11 of the CRCs have been established outside of the central region (e.g. in our region in Győr and Sopron) with a view to strengthening regional innovation systems and regional RTDI collaboration.

**Networking and clustering**

The role of clusters in national innovation systems is now well established. Innovative clusters can be defined as networks of interdependent firms, knowledge-producing institutions (universities, research institutes, technology-providing firms), bridging institutions (e.g. technology extension services) and customers, linked vertically or horizontally in a production chain which creates value added; they co-operate in developing and using sector-specific public goods, based on common physical and knowledge infrastructures.

Innovative clusters can contain few or many enterprises and small and large firms in various ratios. They can be more or less knowledge-intensive, involve a larger or smaller set of knowledge-producing and bridging institutions, and have a narrow or broad sectoral and technological focus, since they occur in traditional as well as in new industries. The geography of innovative clusters is often complex, transcending the traditional geographic boundaries of economic regulation.

The idea of a cluster-based regional economic development strategy first appeared in the Regional Innovation Strategy (RIS) of West Transdanubia in spring 2001. Several competitive economic sectors, with large numbers of employees and a strong presence of SMEs and large companies, were identified.

In West Transdanubia, all clusters were developed bottom-up. The most important – the Pannon Automotive Cluster (PANAC), the Pannon Wood and Furniture Cluster (PANFA), the Pannon Electronics Cluster (PANEL) and the Pannon Thermal Cluster (PANTERM) – have a common infrastructure and/or institutional management. In 2005, new bottom-up cluster initiatives were encouraged by the Pannon Business Initiatives and the Western Pannon Regional Development Agency. Three of these – the Pannon Textile Cluster (PANTEXT), the Pannon Logistics Cluster (PANLOG) and the Pannon Local Product Cluster (EcoCluster) – received significant financial support from the Innovation Fund. In addition, a cluster initiative is under way in the field of renewable energy and related technologies.

PANAC was founded in 2000 by nine organisations (the number increased to 12 in 2001); 70% are manufacturers, 40% are small, 34% medium-sized and 26% large companies. There are four automotive manufacturers (Audi, GM, Suzuki, Rába) and three suppliers (Luk, Benteler, Videoton). The cluster also includes service providers to automotive firms. Besides manufacturing companies and service providers, the other members of the cluster are Széchenyi István University, the Regional Development Council, Consulting & Research for Industrial Economics Ltd., and two banks.

The management of PANAC is in Győr. In 2006 it moved from the university to the Innonet Innovation and Technology Centre in the Győr Business Park, which provides an innovative
environment close to the firms. While the initiative came from West Transdanubia, 35% of its members are located in Budapest or its agglomeration area, 32% in West Transdanubia (half of them in or around Győr), 20% in Central Transdanubia, and the rest in other Hungarian regions. This geographical dispersion is not conducive to the development of intensive cooperation and knowledge diffusion. In most cases, more than 100 km separate members, and the main flows of communication and information are between the management and the members rather than among the members.

PANAC is a division of West Pannon Regional Development Agency, the most important development organisation in the region. The formal decision-making body is the cluster committee, which is comprised of the founders, among which are the large manufacturers (Audi, Suzuki, GM, Rába, LuK). Members pay an annual membership fee and are the most important target of PANAC’s services but are not involved in defining the objectives and tasks of the cluster management. The decision-making process is somewhat awkward both because of the structure of the cluster committee and the fact that, except for Audi, GM and Rába, the activity of most of the committee’s members is limited. Smaller active firms in different areas should also participate. (Grosz 2006.)
III.4. SWOT analysis for the general situation of the business sector mainly identifying the main problems innovative enterprises are faced with

SWOT of the West Transdanubian Innovation System

Strengths

- Successful transformation of the economic structure, high level of foreign direct investment
- Settlement of large multinational companies, some of them with significant R&D capacities
- Formation of regional cluster organisations connecting to the key sectors of the region
- Establishment of a wide-range institutional network connecting to the supply side of innovation 24 industrial parks in the region, some of them with higher level services for technology and innovation
- Organisations and institutions with the required competences are engaged in the establishment and the operation of a regional innovation network
- Skilled industrial workers are opened for new knowledge and stable SME sector in the region
- Dynamic higher education institutions with important infrastructural background
- Existing strategies and programmes give priority for innovation and cooperation
- The location within the latent center of the Budapest-Bratislava-Vienna-Graz-Zagreb urban area
- High degree of employment
- Clear environment due the Iron Curtain, natural values, nature-protection areas
- A strong regional institutional system on the Austrian side
- Exceptional renewable energy and thermal potential in the area

Weaknesses

- Highly centralised system, weak regional institutions without financial independence
- Weak regional innovation and R&D performance compared to the economic weight of the region
- Considerable difference between the R&D potential and the income producing capacity of the region
- Low level of cooperation between the higher education and the business sphere
- Fragmented higher educational system with several participants, no campus university
- Business sphere, especially SME’s, are not really innovation, and R&D oriented
- Low level of cooperation between innovative large companies and SMEs
- Lacking innovation oriented services in industrial parks and bridging institutions
- Parallel and overlapping activities and tasks in the different supporting organisations in the region
- Unsuccessful participation in national and international R&D tenders
- Weak sector of small and medium-sized enterprises
- Weak suppliers’ chains
- Weak higher educational and R+D institutional background
- A very weak regional and local institution system on the Hungarian side
- Weak intraregional transportation infrastructure

Opportunities

- New resources for innovation (both national and EU)
- Activities of new organisations (Regional Innovation Agency and Council)
- Development of the regional knowledge base encourage the knowledge diffusion
- Introduction of new innovation services
- Strengthening of the cooperation between universities and business
- Developments concentrate on networks, knowledge base, and innovation
- Settlement of R&D oriented firms in the region
- Support of R&D activities of firms in the regions
- Cluster services for higher R&D activities of members
- Development of technology and innovation services in industrial parks
- Network initiatives
- Industrial parks, alternative instruments
- European Union development sources
- Unexploited local natural and cultural values
- Favourable macro-environment for certain potential dominant branches (bio-material, tourism)

Threats

- Regions main traditional sectors face strong competition from other EU regions due to technological changes
- Lack of R&D capacities Lack of R&D and innovation oriented firms
- Financial problems of existing cluster organisations
- Problems in financing innovation activities of SME sector
- Lack of skilled workforce
- Low level of regional suppliers of multinationals
- Bridging institutions do not consider the demand for services
- Lack of decentralisation of innovation policy
- Closing down of factories and lay-offs due to the decrease of the import demand of main markets
- Migration of intellectual capital
- The draining effect of the neighbouring big metropolitan centers
### Prioritisation matrix

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<tr>
<th>Chance of Occurring</th>
<th>Possible impact to the region</th>
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<td>High</td>
<td>High level of clusterization in the region</td>
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<td>Low rate of R&amp;D activities</td>
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<td>Medium</td>
<td>Change of goals in innovation promotion system: Productivity instead of Creativity</td>
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<td>Low</td>
<td>Low level of national funded R&amp;D</td>
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IV. Suggestions and proposals for recommended steps to inform interested parties and make them aware of existing situation, available and planned programmes and initiatives, ways to overpass the problems of entrepreneurship (innovative SMEs). ..

Despite high productivity growth, Hungary’s innovation performance has remained well below its potential. Innovation – notably innovation based on own R&D and technology development – is not yet a main driver of economic growth. Turning innovation into a more powerful engine of growth in productivity and GDP per capita requires more determined strides towards a knowledge-based economy and a spur to innovation throughout the economy.

Main elements of the success RDI policy in national and regional level:
- Improving the governance of the innovation system.
- Fostering innovation in the business sector.
- Strengthening the links in the innovation system.
- Fostering critical mass, excellence and relevance of public research.
- Maximising benefits from the internationalisation of R&D.
- Strengthening the human resource base for STI and innovation.

Improvement of innovation environment of the regions

Three groups are targeted by this priority: the organisations responsible for economic development, enterprises, and the civil society organisations.

Regional innovation award and premises marketing

The regional innovation award is announced every year in order to stimulate growth in the West Transdanubian Region’s innovation performance - which is nationally significantly lagging behind - and to appreciate the results of research and development in the region.

The West Transdanubian Regional Development Council will establish the award presumably in 2007. The Hungarian Innovation Association supports the regional innovation award as well. The award can be gained by those small and medium size enterprises, which are based in the region, and realised significant innovation with great profit in the previous year.

The preparation of the West Transdanubian Region „knowledge” database

During the preparation of the strategic programme it became clear that the regional innovation actors are not familiar with each other’s services and the possibilities, experts of the institutions of higher education and research and development. For this reason there is a need for a database containing the researchers of different institutions, and contact addresses of business and innovation consultants. Besides the experts per sciences, the database will have to contain historical and past research and development works and references. The regional „knowledge property” has to be accessible on internet, which will help the region’s innovation actors in developing their research and development co-operation, and widen their
interregional co-operation. A very important factor for a good database is its continuous update. For this reason, the organisation dealing with the maintenance of the database will have to carry out marketing activities as well.

The improvement of knowledgebase and the stimulation of the knowledge

The priority tries to contribute to the development of knowledge and knowledge base with three instruments: direct financial support, education and training programmes, and the support of the cluster initiatives and research and development co-operation.

Support of research and development and innovation projects

The Support programme aims to increase the West-Transdanubian Region’s low research and development investments by supporting research and development projects of small and medium size enterprises, research bases, higher educational and research institutions. The support programmes aim to support new product and procedure development activities of the above-mentioned organisations, and to contribute to the competitiveness increase. The following activities are supported research and development projects:

- **Mechanical preparation activity**: purchase of new production tools, machines necessary for the application of new technology, production and monitoring activities methodology procurement or modification.
- **Production start up** and pre-production development: product modification or procedure, workforce retraining, cost of test production.
- New products’ **marketing costs**: introduction of the new product, market tests, advertising costs.
- **Cost of technology procurement**: patents, inventions, licences, know-how, trademarks, draft plans.
- Procurement costs for planned product or procedure innovation machines and equipments.

Support of innovation networks and co-operation projects

The situation analyses of the strategic programme presented that regional enterprises had no or few co-operations with economic-technological consultant and business service companies, research institutes and the co-operation with other enterprises is also limited. According to international experiences however, the most effective way of innovation is the collective learning from other enterprises.
The development of the innovation infrastructure

The priority aims to stimulate the quality refreshment of regional innovation infrastructure, and encourages the formation of services in line with the company’s need. Support the purchase of research and development instruments, innovation centres and research centre cooperation network, network of innovation experts and consultants.

Financing innovation

The realisation of the innovation investment programme and an independent regional innovation fund – as it was recommended by the regional development programme as well – should be supported by all means. This can only be financed mostly by PHARE CBC sources, however the region can also play the role of initiator. From these resources beside the start up enterprises, the supplier enterprises with growing potentials, the existing product clusters’ development and their co-operation can be financed. The realisation of the priority according to needs, strategic goals and the outlined target groups can be helped by the following measures:

Support the start up, technology oriented, innovative enterprises

The realisation of the especially innovative business plans with growth potential laid a heavy weight on the future entrepreneurs with modest financial background. The beginners, less than three-year-old, or just to be launched - by one or more founders - West Transdanubian enterprises can receive financial support for the duration of 2-3 years. The applicant, with high growth chances, can realise its start up development financing from the same fund. After the first results, the patent and the draw up of the detailed business plan, the applicant can benefit as a „sleeping partner” from a larger developmental capital investment fund.

Dissemination

The result of the study should circulated all stakeholders of the regional innovation system in the region through website, seminars conferences, presentations and network meetings in Hungarian and English languages too.

All the information from best practices help the awareness of the innovation so the one of the main important role of the stakeholders to disseminate the achievement of regional innovation outcomes.
V. Main Conclusions

Posing the Problem

In order to promote innovation a shift in the paradigm is required. Developing innovation cannot be fed upon theoretical grounds. Theoretical principles, statistics, and scientific approaches are completely ineffective as far as promotion of innovative processes is concerned. If the European institutional system deals with the role and importance of innovation in theory and more and more financial resources - public ones - are allocated to that area, our arrears compared to the US, Japan, or some North European countries would increase. A complete shift of the paradigm could resolve this paradox: to accept the fact that the innovation process is unique in each case and cannot be standardized, so unified schedules and financial schemes cannot be set up as well; an effective support and development can be accomplished by the full enforcement of the principle of subsidiarity in a completely decentralized manner.

How Do We Use Innovation Statistics?

If one deals with complex systems that are difficult to see through – such as the issues of innovation and development – one needs simplifying schemes and prescriptions. One has to approach to a system of issues from different points of view in a simply interpretable manner. Such simplified approaches can also be obtained by the use of statistical figures. Selection of the innovation parameters used in Europe can also be useful, but now let us deal with the statistical figures mostly used in Hungary and Central Europe: R&D expenditure, number of research sites, number of research subjects, number of research staff. Regrettably, though these figures are generally regarded as classical numbers of comparison between innovative development of different regions, they have very little to do with the efficiency of the innovation processes. This is because, that a higher number of researchers do not necessarily involve more patents and a higher level of R&D expenditure does not necessarily involve more marketable products. A diversity of research subjects is even bad for focusing capabilities, outstanding performance, concentration, excellence. Likewise, we do not obtain an exact picture from the SME-related statistical data, as almost every enterprise is SME (from the one-man hairdresser ‘company’, through the micro enterprise dealing with accounting, to the medium-sized supplier enterprises) and from among these very few have development and innovation activity.

Why Innovation Cannot Be Promoted Well on Macro Level?

This is because each and every innovation processes are completely unique and pretty much complex! If we look at the theoretical model of linear innovation, for example, we can state that we are professional in this or that stage of it, however, one can hardly find anyone who would be competent in the whole process. The question highlights several factors, such as importance of the cooperation culture, teamwork, necessity of versatile competences. Also important is the awareness of complexity and the ‘on the job’ training. Each and every innovation process trains also the facilitator because of its unique nature.
Creativity or Productivity?

Creativity is a high prestige capability of less people than the number of those desiring such. Productivity is of lower prestige, although it is more important for making any innovation process successful. We are not in lack of creativity in our region. Several creative ideas arise, but very few of them are realized because of the lack of productivity. Having three ideas realized is obviously better, than five good ideas of twenty, where only one will be materialized. Although a successful innovation system should work this way, as the model shows.

Potential in Development

We need good innovation experts in practice with wide range of experiences, who are committed to pushing through a process, not starting several never-ending processes. Risk taking is of higher importance. A smaller immediate achievement is better, than a dubious „big hit” in the future.

An innovation project should preserve its unique nature, any transformation or squeezing through institutional standards should be avoided.

The means should be handled by the direct management of an innovation process. Such means should be as flexible as it is required by the individual projects.

The prestige of entrepreneurship should be increased in order to foreshow the successful innovations and to motivate people to realize creative ideas.

The EU sponsorship for innovations should be changed completely and made to practice-oriented.
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