Innovation policy in six candidate countries: The challenges
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Innovation Policy Profile: Slovenia

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1.1 Issues for innovation policy arising from the process of economic reform and accession

In macroeconomic terms, the period from 1996 onwards may be characterised for Slovenia as stable and favourable.

In macroeconomic terms, the period from 1996 onwards may be characterised for Slovenia as stable and favourable. Annual rates of growth improved from 3.5 percent in 1996 to 5.2 percent in 1999, with estimates of 4.6 percent growth in 2000[1]. Average inflation rate decreased from 9.7 percent in 1996 to 6.1 percent in 1999. However, in 2000 it increased to 8.9 percent, driven mainly by external determinants (oil price increases, US$ appreciation)[2]. Gross fixed capital formation was very dynamic and increased from 23.4 percent of GDP in 1996 to 28.4 percent of GDP in 1999. In 2001 decline to 27 percent is projected. In the second half of the nineties the growth of exports of goods and services lagged behind the growth of imports of goods and services, gradually deteriorating current account balance. In 2000 the deficit of current account balance amounted to 3.2 percent of GDP and external debt to 34.3 percent of GDP (Spring Report 2001, IMAD). Although some structural reforms remain to be accomplished regulatory and institutional framework is progressively being harmonised with the acquis.

[1] Statistical Office of the Republic of Slovenia, May 11, 2001.

[2] Poročilo, IMAD, March 2001

Notwithstanding such positive trends in macroeconomic environment, slow implementation of structural reforms in some segments and the deficiencies in institutional framework and in the innovation system were not conducive to strengthening the innovation capacity of the Slovenian economy. Slovenia inherited some advantageous features of the socialist system related to S&T: a decentralised system of research institutions not being organisationally linked to the academy of sciences and governmental bodies, openness of institutes for contractual co-operation with the business enterprise sector, autonomous management decision making, traditionally good linkages with Western academic institutions etc.

On the other hand, the beginning of market reforms explicitly showed also disadvantages of the inherited structures: rigid research and higher education institutions, overstaffed R&D personnel in some research institutes of previously federal importance, overemphasised basic research in comparison with the applied research and experimental development, a slow and ineffective innovation system, insufficient linkages and mechanisms between the university based R&D and the socio-economic needs of the society. Deficient innovation culture in the enterprises, in the public sector institutions, as well as in the administration further hampered innovation orientation. Only in the discussions related to the budget for the year 2000, has technological development for the first time explicitly appeared among the major priority areas in Slovenian development. (The EIU report on Slovenia, May 2000). However, this has not produced any effect on the amount of finance for technological development so far.

Only in the discussions related to the budget for the year 2000, has technological development for the first time explicitly appeared among the major priority areas in Slovenian development.

Restructuring of the enterprise sector

Although the privatisation process[3] was to a large extent concluded in 1998 there still remains important non-privatised segment of economy, which refers to enterprises in the portfolio of the Slovenian Development Corporation and to state-owned enterprises (public utilities). This delay is being recognized by the government and in the beginning of 2001 a set of measures to speed up the privatisation in these two areas have been introduced, including plans to close/ restructure Slovenian Development Corporation and prepare the required legal framework for privatisation of state-owned enterprises (banking, telecommunications, etc.)

At the end of the nineties, enterprises with concentrated ownership structures started to shift from a defensive restructuring to offensive restructuring (new investments and programmes which increase capacities and employment).

[3] The transformation of social ownership of Slovenian enterprises to private ownership was a mixture of free distribution, internal buy-outs with discount and commercial privatisation. The majority of enterprises favoured internal buy-outs resulting in dispersed internal ownership, which is only recently being consolidated. Heavy loss making enterprises which could not be privatised were transferred to the Slovenian Development Corporation (SDC) The objective of the SDC is to restructure enterprises in their portfolio, privatise them afterwards or liquidate in case of unsuccessful rehabilitation.

At the end of the nineties, enterprises with concentrated ownership structure (foreign and personal companies) started to shift from a defensive restructuring (primarily dis-investment and lay-offs) to offensive restructuring (new investments and programmes which increase capacities and employment), this gradually contributing to increased R&D activity within firms. On the other hand, the majority of privatised enterprises still need to establish efficient ownership structure and corporate governance to undertake offensive restructuring.

Experts expect the 1999 State Aid Control Act to have a positive effect on innovation policy, changing the orientation from redistribution towards development.

Government intervention aimed at restructuring of the economy was in the last four years primarily oriented at preventing the breakdown of large enterprises (thus also alleviating social tensions) and to a much lesser extent at supporting development orientation of enterprises. At the end of 1999, Slovenia passed the State Aid Control Act by which it is obliged to follow relevant EU rules. State aid monitoring commission was set up and annual reports on state-aid for 1998 and 1999 were prepared. Direct state aid[4] as a percent of GDP had an upward trend till 1998 when it accounted for 2.53 percent of GDP, while in 1999 it decreased slightly to 2.44 percent of GDP (Autumn report, 2000, IMAD). The bulk of state aid is accounted for by manufacturing activity although its share is decreasing along with the increasing share of agriculture. In 1999, agriculture and fishery accounted for 30.3 percent of direct state aid, transport 12.4 percent, mining 5.4 percent, manufacturing and other services 51.9 percent. Within manufacturing, only 1.2 percent of state aid was geared to regional objectives (Annual report on state aid in Slovenia in 1998 and 1999) significantly differing from the EU pattern.

Beginning with 2001, the state aid policy is changing from redistribution orientation towards development orientation. Accordingly, state aid is expected to focus on promotion of transfer of know-how from the research sphere to enterprise sector, to basic and applied research, to industrial R&D, to pre-competitive activities, etc. (Poročilo, IMAD, March 2001). Some experts expect this will have positive effect on innovation policy.

Industrial policy

The Government began in 1997 to introduce financial instruments to increase the capability of the enterprises to meet the challenges of international competition.

The persisting technological gap of Slovenian manufacturing behind the EU negatively reflects upon competitiveness of the Slovenian economy and could hamper the integration of Slovenia to the EU. On the basis of »The Strategy for increasing the competitiveness of the Slovenian industry« (adopted in 1996 and updated in 1998), the Slovenian Government in 1997 began to introduce financial instruments in nine horizontal programmes to

[4] Without state aid of local governemnts.

increase the capability of the enterprises to meet the challenges of international competition.

The programmes were:

- Technological modernisation and increased role of R&D.
- Stimulation of the development of small and medium-sized enterprises.
- Stimulation of companies' integration.
- Management education and industrial training.
- Export promotion.
- Promotion and stimulation of investments.
- Stimulation of the use of information technology in enterprises.
- Promotion of environmental approach to business.
- Harmonisation of technical regulations.

There are however no estimates as to their impact on innovative capacities of enterprises.

Selected instruments and measures are being introduced on an annual basis. The emphasis introduced by annual update in 2000 was R& D, export development and promotion of foreign direct investment. In the beginning of 2000 also a benchmarking analysis was prepared by the Ministry of Economic Affairs comparing competitiveness of Slovenian industries with that of the EU and other OECD Member States. As a result, the potentials in promising industries were identified, such as biotechnology (Benchmarking Slovenia, Ministry of Economic Affairs, 2000).

For the period 2001-2005, the Ministry of Economy declared following key elements of the programme of Section for enterprise development and competitiveness[5]:

- Increase of competitiveness of Slovenian industry by improving competitive and innovative capabilities of enterprises for successful export activities and promotion of foreign and domestic new investment
- Increase enterprise investment in technology development and innovation, promotion of development of own know-how and transfer of know-how to Slovenian industry
- Promotion of entrepreneurship and development of SMEs via establishment of supportive environment
- Promotion of tourism development and parallel service activities.

It is argued that the industrial policy should be formulated at the central government level rather than at the level of individual

[5] Ministry of Economy: programme priorities for 2001-2005, internal document.

ministries since the latter tend to produce a set of mutually non-co-ordinated programmes (Autumn Report, IMAD, 2000).

In November 1999, the Ministry of Small Business and Ministry of Labour developed an anti-bureaucracy programme

Currently, the Strategy of Economic Development of Slovenia is being prepared, to be supplemented by the National Development Plan (2001-2006). These documents will specify strategic orientation of Slovenia as well as key investment priorities, thus defining industrial policy. The Government should submit both documents to the Parliament within this year.

Small and Medium-Size Enterprises' (SME) Policy

The main obstacle for the development of SMEs seems to be access to finance

In 1996, Slovenia introduced the first Strategy on the development of SMEs while the new Strategy is under preparation[6]. Its main objectives are the promotion of quality of innovation and of technological renovation of SMEs. The promotion of development of SME's, which in 1999 accounted for 48 percent of the total employment has also been identified as a priority in the Accession Partnership of Slovenia with the EU. The establishment of an efficient administrative environment for enterprises is seen as a key element in promoting SME's development. In November 1999, the Ministry of Small Business and Ministry of Labour developed an anti-bureaucracy programme in the framework of the National Action Plan for Employment (2000-2001). Its main objectives are: to decrease significantly the costs of setting up new enterprise, to shorten the time required and simplify procedures for setting up enterprises (14 days), to eliminate all barriers which prevent faster growth of SMEs, to eliminate discrepancies between individual laws and by-laws, to introduce labour and employment legislation and regulation which provide for flexibility of SMEs and for social security of employees, and to develop the "one-stop-shop". With the restructuring of the government and new government in office in late 2000, the Ministry for SMEs was abandoned and its activities integrated under the Ministry of Economy.

The implementation of the above documents lags behind the declared policy and programmes. One of the most important instruments for promoting SMEs - subsidized loans and guarantees- under the regional guarantee funds did not succeed due to the lack of financial resources, which was to be provided by the government. Overall poor financial discipline in business sector additionally affects SMEs. It is not surprising though that the EC Regular report on Slovenia (2000) points that the main obstacle for SMEs development is the access to finance.

[6] Draft Strategy for SMEs and Entrepreneurship Development in Slovenia in the Period 2001-2005, October 2000.

Institutional support for SMEs at the regional and local level is provided through Small Business Development Centre[7] (SBDC) and partly also through local and regional chambers of commerce and trade. It seems however that the operations of both types of institutions are sometimes overlapping, creating confusion among entrepreneurs as to whom to refer to for support and supplementary services. In addition to that local and regional development centres still abound in bureaucratic procedures (Basle, 2001). The government intends to withdraw from direct financing of local and regional development centres while it will provide finance for certain programmes of centres also in the future. Also, it will re-establish subsidized loans and guarantees as an instrument of promoting SMES and centralise the allocation of financial incentives to entrepreneurs.

Industrial R&D

The share of government funds in total expenditure for R&D has been decreasing since 1993 (58.7 percent). The data for 1998[8] report only 40.7 percent of the total investment spent on R&D came from government. So far, the government R&D policy was not successful in extending support to technological restructuring of enterprises, due to the lack of funding and of appropriate mechanisms, which particularly affected the development of technological potential of SMEs (e.g. venture capital funds) (The EIU report on Slovenia, 2000). Notwithstanding the »Programme of support of technological development up to the year 2000« prepared by the Ministry for Science and Technology in 1994 to support technological development in the period 1995-2000 the funds available for this purpose have been decreasing as a proportion of the state R&D budget. This can be illustrated by the structure of expenditures of Ministry of Science and Technology: in 1990 the ratio between basic and development research was 70:30 to drop to 83:17 by 1999 (data from MST).

After the privatisation and organisational restructuring of majority of the large socially-owned enterprises was accomplished (in this process a number of R&D units in manufacturing were abolished), R&D spending in the restructured enterprise sector began to increase. In 1996, it surpassed government spending and the gap in favour of business spending has been widening since. This would be encouraging, but a closer look at the structure of business spending reveals that two sectors account for over 77% of all R&D investment in manufacturing.[9]

After privatisation R&D spending in the restructured enterprise sector began to increase. In 1996, it surpassed government spending and the gap in favour of business spending has been widening since.

[7] It was established already in 1992. In the beginning of 2001 30 local and 13 regional business centres were included in small business support network which is to become a basis for pursuing the coordinated regional development policy (see chapter 3.3. on SBIN)

[8] Rapid Reports, Statistical Office of the Republic of Slovenia (SORS), No.13, 2001.

[9] These are pharmaceuticals and electric, optical and transport equipment.

In 1997, only one in ten manufacturing enterprises has its own R&D unit, on average employing only 10 engineers. Only enterprises in pharmaceutical, chemical, rubber and electric engineering have larger R&D units. Long lead times to launch new products (12 years) or new production processes (8 years) are characteristic for Slovenian innovation activities (SORS Rapid Reports, No.292, 1999).

The lagging behind of Slovenian enterprises in terms of innovation condition is further illustrated by the assessment of technology development level of Slovenian manufacturing. Recent analysis reveals (Gliha, 2000) that in 1997, 88 percent of the total workforce in manufacturing was employed in enterprises with low or medium level of technology assessment, producing 78 percent of gross value added in manufacturing. The results of the analysis show only modest improvement compared with 1995 and are to a large extent attributed to information techology introduction and less to advanced technologies based on R&D.

Financial market reforms

For the time being the financial sector still lacks the mechanisms and levers for the support of technological restructuring of the enterprises and the introduction of innovation.

A number of different reforms were undertaken in the nineties, including especially the passing of the Banking Act, the Securities Market Act and the Insurance Act in 1999 and in 2000 harmonising the Slovenian legislation with the acquis, yet the implementation of the above acts will take time. For the time being the financial sector still lacks the mechanisms and levers for the support of technological restructuring of the enterprises and the introduction of innovations, such as investment banking and venture capital funds[10]. The existing venture capital funds are mostly oriented to large enterprises depriving SMEs of the opportunities to introduce innovation. The experts from Chamber of Commerce and Industry claim that benefits of establishing venture capital funds for SMEs could be realised in a short period of time since the SMEs dispose with numerous innovations which they have accumulated in the last five years but could not marketed them due to the lack of funds. Credits provided by the banks are too costly for SMEs and require high guarantees.

It is also believed that the delay in the privatisation of state owned banks[11] does not stimulate the banking sector to provide new products adapted to SME's or NTBFs needs. Due to underdeveloped and shallow capital market (non-existent primary issues of securities) which would provide for more favourable long-term financing, the banks remain the major source of long-

[10] At present only two venture capital funds exist. But according to financial journalist (Delo, Dec.2000) a number of new Funds are under preparation and are to be launched in 2001. See also Section 3.

[11] In end May 2001, the goverrnent accpeted the plan for privatization of the two largest banks, where the state is a majority shareholder.

term financing for the enterprises. Most banks however rely on traditional banking services, while more sophisticated products and services (e. g. investment banking) lag behind.

Fiscal/tax policy

As to fiscal incentives for innovations, no elaborated or transparent system exists. In general, tax allowance relates to all investment, irrespective of its character, while tax allowance for innovations is provided only within technology parks. This is however not sufficient since the potential for innovations extends beyond technology parks. The introduction of special tax incentives for innovations is strongly urged by the Chamber of Commerce and Industry.

The introduction of value added tax in 1999 increased the costs of services provided by R&D sector to the industry further hampering their co-operation and also affecting innovation[12]. R&D sector was not exempted from 19 percent general value added tax rate as was the case with the education. With regard to personal income tax, the tax base can be reduced up to 3 percent for school fees, voluntary financial contributions and donations for scientific and research purposes and the funding earmarked for the founding of science and research institutions.

Foreign direct investment

As to fiscal incentives for innovation, no elaborated or transparent system exists. In general, tax allowance relates to all investment, irrespective of its character.

At the end of 1999 the foreign direct investment (FDI) stock in Slovenia totalled USD 2,683.6 million. By far the largest investor is Austria with 42 percent share, followed by Germany (12.8 percent) and France (11.6 percent). Although manufacturing industry still leads as the most important recipient of FDI (paper manufacturing, motor vehicles, chemicals and chemical products), it is being closely followed by services (banking, trade and business services). The importance of FDI for the functioning of the Slovenian economy has been steadily growing since 1994. At the end of 1998, foreign-owned companies (with at least 10% foreign participation) represented only 4.3 percent of non-financial corporate sector, accounted for 11.1 percent of total capital and 8.8 percent of all employees, but generated 15.9 percent of total net sales, 19.0 percent of total operating profit, accounted for 14.0 percent of total investment outlays and exported as much as 27.6 percent of the Slovenian non-financial corporate sector's total. Some case study analysis of the impact of FDI on local enterprises with foreign ownership show that product quality was upgraded, as a result of changes in production

[12] The Law on Value Added Tax stipulates that Slovenian institutions participating in EU funded programmes are not obliged to pay 19 percent value added tax. The introduction of by-laws which would enable to administer such provision of the Law on Value Added Tax lags behind which is counterproductive also for innovation activity.

and technological process, and of more accent given to product quality in general. Also, management's and workers' training considerably increased (Rojec, 1998) This could be an indication that overall contribution of FDI to innovation is positive, since FDI brings new technology as well as new managerial concepts to Slovenia.

Since 1997, annual inflows of FDI marked downward trend mainly as a result of administrative barriers, of delayed restructuring of the enterprise sector (which would stimulate them to seek strategic partners) and of passive policy towards FDI. Economic policy measures introduced in 1999 and in 2000 (Foreign Exchange Act, ratification of Europe Agreement, Programme of the Government of the Republic of Slovenia for the Support of FDI in 2000) show a positive shift in government policy towards FDI. Larger increase in inward FDI can however not be expected (Autumn report 2000, IMAD) without strict implementation of the Programme for the support of FDI particularly concerning the simplification of administrative procedures, privatisation of the state ownership with a broader openness to the participation of foreign investors in this process. In the beginning of 2001 the inflow of FDI has increased substantially due to the entrance of foreign suppliers of telecommunication services to the market. The contribution of FDI to innovation activity in Slovenia can be expected along with the growth of FDI.

1.2 Main developments in innovation policy

In 1994, the government of the Republic of Slovenia issued a key policy document in the area of innovation and technology development »**Technology policy of the Republic of Slovenia«**. The policy document was supported with specific programme prepared by the Ministry of Science and Technology (MST) called **»Programme of Support to Technological Development up to the Year 2000«**. According to the Programme, the funds for technological development were to grow on average by 10% a year during the period 1995-2000. The funds available for this purpose have in reality been decreasing, since the share of S&T in the budget was decreasing. In fact, the highest level of R&D investment relative to GDP (1,8%) was achieved in 1994; only to drop to 1,5% by 1998.

In the »Technology policy« document it was also foreseen that its practical implementation would involve several ministries in a co-ordinated fashion, but in reality the functioning of the policy was left to MST and their programmes. The only other programme indirectly supporting innovation policy, was the document passed by the Ministry of Economic Affairs in 1997: **»The Strategy for**

increasing the competitiveness of the Slovenian industry«. As can be seen in the previous chapter some of the horizontal programmes are directly focusing on technology development and innovation.

In 1998, the project proposal for **Slovenian Innovation Agency** (SIA) as defined by PHARE was presented to the MST with elaborated mechanisms, instruments and financial resources required aimed at stimulating innovation. The main programmes backed by the SIA referred to technology development, stimulation of e-commerce and Internet, stimulation of entrepreneurship, innovation, and of internationalisation. The interview source stated that the lack of consensus on the status of SIA at the MST was the main reason for the failure in establishing SIA. In fact, the Minister never launched the project proposal to the normal administrative procedures, which would provide for the establishment of SIA. On the other hand, some experts believe that in order to be successful the project would need integral support from more than just one ministry, while others were of the opinion that the proposed plan/ budget of SIA was too ambitious in view of the available resources.

A key new law supporting innovation and industrial R&D was adopted at the end of 1999.

As already mentioned, one of the key new documents supporting innovation and industrial R&D was adopted at the end of 1999. The **»Law on Support for Enterprises in the Development of New Technologies and Establishment and Operation of their R&D Units in the period from 2000 to 2003«** is to provide for increased financial support to the enterprises, co-ordinating the programme of eight Ministries[13]. In the preparation of the government programme for the Law's implementation (**Government Programme for the Support of Technological Development**), all eight Ministries, plus the Chamber of Commerce and Industry, Chamber of Crafts and Slovenian Development Corporation also took part. The funding of the programme was to come from the privatisation of certain government- owned enterprises - so called B budget. The government programme was to allocate 13,5 bn SIT[14] for promotion of technological development within six sub-programmes:

- The incentives to enterprises for R&D activities in development of new products and technologies (four types of

[13] Ministry of Science and Technology (MST); Ministry of Economic Activity (MEA); Ministry for SMEs and Tourism (MSME); Ministry for Economic Relations and Development (MERD); Ministry of Finance (MF); Ministry for Environment (ME); Ministry for Agriculture, Forestry and Food (MAFF); and Ministry of Labour, Family and Social Affairs (MLFS). With the changes in the government organisation, the names of responsible Ministries have changed slightly: Technology part of MST is now with the Ministry of Economy (previously called Ministry of Economic Affairs), so are the Ministry for SMEs and Tourism (MSME) and the Ministry for Economic Relations and Development (MERD).

[14] 1 EUR= 193.62 SIT(Bank of Slovenia average exchange rate for 1999).

measures, to be co-ordinated between MST, MAFF, MEA, MSEM, and SDC).
- The incentives to enterprises for establishment of their own R&D departments and units (three types of measures; MST, MLFS, MEA, MAFF, MSEM).
- Incentives for networking and common activities in the field of R&D departments and units (three types of measures, MST, MEA, MSEM).
- Innovation incentives in regional R&D (four types of measures; MST, MSEM, MEAD, MEA, MAFF).
- Human development in R&D (six types of measures, MST, MLFS, MSME, ME, MEdu).
- Other measures (risk fund for NTBF, etc.; 8 types of measures, all ministries, plus SDC).

The programme elaborates specific measures, its objectives and criteria to be used for the selection of co-financed projects in all six sub-programmes. It provides for a very systematic approach to industrial R&D promotion and innovation policy and if implemented, could contribute significantly to innovation capabilities of Slovenian enterprises. The Programme is still in the governmental procedure pending its amendment with approved schemes of state aid.

The programme provides for a very systematic approach to industrial R&D promotion and innovation policy.

Its implementation depends among other things on two key factors: B-budget and a new **Law on Organisation and Funding of Research and Development**.[15] The latter Law was submitted to the Parliament in January 2000, with Minister asking for accelerated procedure. Due to heavy criticism from The Academy of Sciences and both Universities it was returned to the respective parliamentary body and the date and form in which it will eventually be passed is impossible to foresee, due to the subsequent change of the Government and reorganisation of Ministries.

The proposed Law had in the first place addressed better organisation of the national system of innovation, especially with regard to encouragement of networking of research organisations among themselves as well as with industrial R&D units. It foresaw the establishment of two independent public institutions - Agency for Scientific Research and Agency for Development and Technological Research. The latter would be needed to implement the governmental programme for promotion of technological development. It remains to be seen what the policy of the new Minister for Education and Science[16] will be in this respect and how much of the current text of the Law will be kept in view of the basic change of the concept (no longer an independent S&T

[15] The new Ministry is now preparing a new text under teh title : Law on Organisation and Funding of Scientific Activty and R&D.

[16] See further in the text explanation on new organisational scheme for S&T in Slovenia.

Ministry).[17] It seems that within the current organisational framework, funding and organisational set-up of science will be linked closer to funding and organisation of higher education (University), while funding of applied research and technology development will be coordinated jointly with Ministry of Economy.

From Jan. 2000, the R&D funding is organised around new Research Programme scheme. On the basis of extensive evaluation prepared in 1999, 334 research groups were selected to receive five-year programme financing. The argument for such scheme coming from the basic research institutes was the stability in funding, yet as the critics like to point out, programme financing means a step back in stimulating innovation and diffusion of technology. On one hand, the R&D sphere is not vitally interested in selling its knowledge to corporate sector since the budget provides the bulk of resources for their functioning. On the other hand, the criteria for evaluation of research groups focus strongly on SCI and other bibliographic measures, giving little if any recognition for co-operation with industry. Since most of the science budget is now tied to the Research Programme funding, the resources for the project funding are severely limited, with negative implications for more applied R&D. In fact, the funding of industrial R&D is now with the Ministry of Economy, as explained in Section 3.

Following the elections in October 2000, the new government initiated a reorganisation of the Ministries. MST was split in two segments, with Science segment going to Min. of Education, and Technology one to the Min. of Economy. It is too early to say how this split will affect the content, since the new law on government has only just become operational. Some critics have questioned the above move in terms of its poor contribution to closer ties between research and industry. It is feared that science will become even more focused on its own priorities and not looking for closer ties with business sector. On the other hand, the arguments in favour of such reorganisation were stressing the importance of linking technology promotion programmes with the activities of the Ministry of Economy and thus securing more co-ordinated approach to innovation promotion.

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It remains to be seen on the basis of work programmes how this new set-up will influence innovation policy. A valid warning was issued by some of the innovation system experts as to the potential danger of low priority assigned to issues of technological development and innovation in the Ministry of Economy. This Ministry is according to the new organisational scheme joining

[17] According to unofficial sources, the recent discussion leaves out of the Law..the establishemnt of the second Agency, since technology is seen as the issue of Ministry of Economy and not of science anymore.

together the tasks of three and a half Ministries before [18]. This means that the workload is substantial and judged by the past experience, innovation system is not likely to be the priority. On the other hand, all of the Ministry's sectors are working closely with business, so the business needs are more likely to penetrate their setting of priorities. Also, it is expected that with full implementation of EU regulations as to the State aid to enterprises more funds will be available for industrial R&D promotion and innovation.

Table 3 - Main policy documents and consultative papers since 1996

Title of document	Organisation responsible	Legal status	Comments
Technology policy of the Republic of Slovenia, 1994	Gov. of Slovenia	Government and parliament decision	not implemented in terms of planned allocation of resources
Programme of Support to Technological Development up to the Year 2000, 1994	MST	Government decision	Action plan for the above policy
National Programme of Research, 1995		Parliamentary decision	Failed in terms of providing increased share of R&D in GDP, poorly implemented in terms of enhancing transfer of knowledge to industry
The Strategy for increasing the competitiveness of the Slovenian industry, 1997	Ministry of Economic Affairs	Government decision	No evaluation of innovation impact
Slovenian Innovation Agency	Phare founded project, MST	Project proposal	No follow-up
Law on Support for Enterprises in the Development of New Technologies and Establishment and Operation of their R&D Units in the period from 2000 to 2003, 1999	Gov. of Slovenia	Government and Parliament decision	
Government Programme for the Support of Technological Development, 2000	Gov. of Slovenia		

Based on interviews, one of the key characteristics of Slovenian innovation climate is that different legal and policy documents affecting innovation (directly or indirectly) are often in collision with one another. While the Act on Support... and its consequent programme look very promising, no/insufficient funds coming

[18] Ministry of Economic Affairs, Ministry of Foreign Economic Relations and Development, Ministry of SMEs and Tourism and technology segment of the Ministry of S&T.

from Budget B prevent it from even taking-off. Besides, institution building in the areas of innovation and transfer of results to industry is still seen as deficient (EC Regular report on Slovenia, 2000). On the other hand, one can observe numerous initiatives, mechanisms and programmes prepared and even executed, but due to their undercapitalisation, end effect remains disappointing. In fact, one could say that every suggestion given by consultants or instrument observed in EU countries was in one way or other introduced, but budget allocation to technology development programmes remains insufficient.

The frustrating part of this is that existing evaluation studies on industrial R&D projects show that the state in fact gets the investment back in a single year after the implementation of the project (via taxes collected due to increased production enabled by technology projects). Evaluation of industrial R&D projects co-financed by the Ministry of Science and Technology[19] is carried out on regular basis (1995-2001) by Institute of Economic Research (see also end of section 3.1).

In 1999, a number of different programmes were announced by various Ministries to indirectly or directly support technology development and innovation activities in the enterprises. Even though the new Law on Support... has envisaged a different allocation of resources and some new programmes, the fact that its practical implementation is still undecided on, means that old programmes are still valid, subject to availability of funds.

Among the more recent activities in the field of technology development and innovation, discussions on foresight need to be mentioned. The government organized a round table of Foresight activities in Slovenia and presented the plan to organize foresight with open invitation to institutions, who will present their project proposals and co-financing schemes (contributions they can/ will raise from the industry). The terms of this public invitation are not yet specified (June 2001), but it is expected that the process will be started shortly.

[19] MST usually provides finance for up to 50 percent of the technology projects.

Table 4 - Major government funded programmes and initiatives in favour of innovation

Name of programme	Government body responsible	Objectives of the programme	Funding available
Industrial development research	MST/now ME	Co-financing of development research in industry	From 75%-25% of total research costs
Preparatory phase for invention	MST/now ME	Co-financing of research and experimental development up to prototype phase	25-50% of total research costs
Promotion of mobility of researchers	MST/ now ME	Co-financing salaries of research personnel in industry (Ph.D. and MA)	Part of the salary
Technology parks/centres	MST/ now ME	Co-financing of infrastructure costs	Partly covered also from other investors
SME support	MSME/ now ME	Co-financing some of the costs of development projects in certain sectors for SMEs	Up to 50% of costs.
Support schemes for restructuring	Ministry of Economic Affairs: MEA/ now ME	Co-financing of restructuring programmes in enterprises in selected sectors	
Interest rate subvention	MEA/ now ME	Subvention of interest rates for mid and long-term loans for companies undergoing restructuring (medium and large firms)	
Interest rate subsidising	MSMEs, Public Fund for SMEs Development	Interest rate subsidising for investment loans for young entrepreneurs, priority for projects related to innovations, technical improvement	For interest rates exceeding 2% nominal interest rate, individual subsidy less than 1.5 million SIT
Development of rural economy	MAFF	Development of innovative programmes of activities for rural households (target group: local communities)	
Development project financing	Technology Development Fund/ Slovenian Development Corporation	Financing for new product/new technology development, transfer of R&D results and innovations to enterprises	Loans, equity investment, bank guarantees

1.3 The innovation policy community

Ministry for Science and Technology used to be the principal actor responsible for setting up technology and innovation policy. Since 1999, a State Secretary was appointed for Technology policy and innovation and special Office for Innovation was set up. The co-financing of industrial R&D projects, of technology parks and technology centres, as well as the mobility scheme (co-financing of the employment of research personnel in the industry) were run via experts within the Office for Innovation and Office for Technology. Currently all of the staff and the activities of the Office have been moved to the **Ministry of Economy**, and this Ministry is to become the key carrier of technology development and innovation policy and support mechanisms.

National Council for Research and Development (NCRD)* and six research committees organised according to broad disciplinary areas. NCRD represented Min. Science highest expert body with the chairpersons of the six research councils comprising its members. It should advise the Minister on issues of research policy, evaluation criteria, distribution of funds, etc. Even though suggestion for the members of NCRD is made from scientific community, the Minister decides final composition.

Technology Development Council* was also an expert body of the MST. The Minister was appointing its members and it was to advise on design and implementation of technology policy and assess technological relevance of projects and programmes. With the restructuring of Government, this Council was found unnecessary by the current Minister of Economy, now in charge of technology development.

Science and Technology Council of the Republic of Slovenia serves as advisory body to the government in matters of S&T, with chairperson and members appointed by the government.

Parliamentary **Committee on Science, Technology and Development** oversees S&T policy as the national legislative authority.

Interdepartmental Committee for Research Co-ordination: representatives of all ministries discuss research priorities relevant for the government needs. Under the new Law on Support...this committee would need to become much more active in co-ordinating different joint schemes, as envisaged in the Programme.

Table 5 - Government funded agencies

Organisation	Status	Main responsibilities
Technology Development Fund/ SDC	Public, non-profit	Financing new products/new technologies development
Technology parks	Non-profit, mixed ownership	Providing infrastructure to high tech firms
Technology centres	Non-profit, mixed ownership	Joint research capabilities and equipment
Innovation Relay Centre	EU co-founded project	Information network

Technology Development Fund, established in 1994 as the first venture fund with ambition to increase investment in R&D by co-financing the development of new product or technology, stimulate the marketisation of domestic research and innovations, and to provide help in establishing small size enterprises applying high technology. While the Ministry of Science and Technology

financed the experimental phase of the project together with PHARE, the Fund was later incorporated within Slovenian Development Corporation. The enterprises can receive a loan; SDC provides capital via equity ownership or issues bank guarantees. (See also Section 3.2.)

After providing the legal framework, two **technology parks** were established in Slovenia in 1994 by interested ministries, public research institutes, business companies, banks, and local authorities and subsidised by the government. **Technology centres** involve co-operation between government, R&D sphere and industry and are aimed at the development of new technologies, prototype production and small-scale production of high-tech products. (Details in Section 3.3.)

Under 4th Framework programme, FEMIRC Slovenia was formed as a part of broader innovation relay network of the EU. So far, FEMIRC was 100 percent financed from EU resources. Its principal task was to provide information and assistance to Slovenian R&D sphere related to V Framework Programme. Since July 1, 2000 the role of FEMIRC has been transformed in such a way as to concentrate its activities on the promotion of innovation in enterprises and on transfer of technology. Accordingly, EU funding provides approx. half of the Innovation Relay Centre (IRC) Slovenia budget (FEMIRC was renamed to IRC), while the other half has to be provided by the Slovenian government. At present IRC prepares regional innovation project in co-operation with the Agency for Regional Development, which will aim at establishing regional one-stop shops. The latter will provide different support services for enterprises related to innovation. It is expected that pilot one-stop shops will be effective in two years period. The building of consensus among all the parties involved (different ministries, chambers of economy, business service providers, and enterprises) will be crucial for the success of the project.

Slovenian Science Foundation set up by the government and sixteen other founders (financial and industrial firms and high-ranking scientific organisations), operating through donations and sponsorships with a task to provide moral and financial support for the development of science, scientific education and promotion of science in society.

Various associations (association of innovators, associations of engineers and technicians, associations of other experts) also play catalytic role and help in establishing the link between R&D and industry.

Business incubators and networks for the promotion of small scale business do not give financial support for the

establishment and operation of small firms, but mainly provide consultancy and information services.

Private consultancy firms are at present rarely involved in promotion of innovation activity. Some do provide services to business companies related to education, innovative management methods and tools, R&D or production and are engaged in activities indirectly supporting diffusion of innovation and technology transfer.

Universities (Ljubljana, Maribor) as institutions have been involved in defining innovation policy only indirectly through comments on regulation of research funding and objection to proposed new Law on R&D.

The Association of Slovenian Researchers has organised several round table debates on innovation and technology policy as well as on co-operation between public research institutes and business, but without major policy impact. More influential in public is the **Chamber of Commerce and Industry**, also participating in the debate on innovation policy framework, stressing the need for more development oriented economic policy to help enterprises restructure not only in terms of ownership but also with new technologies, products and marketing methods.

1.4 Assessing innovation potential: data collection, surveys and indicators

The main government agency gathering innovation statistics in Slovenia is the Statistical Office of the Rep. of Slovenia, professionally independent government organisation. The Statistical Office collects the following statistics:

- Annual Report on Research and Development Activity.
- Census on Innovation Activity in Manufacturing.
- Census on innovation Activity in Selected Services.

Since 1993, the Annual Report on Research and Development Activity has been based on OECD Frascati methodology. R&D data has been collected regularly since 1995 and published in Rapid Reports (yearly); Statistical Yearbook of the Rep. of Slovenia; Slovenia in figures. Also, a special publication containing all statistical data on R&D and innovation for the period 1993-1999 is being prepared.

The census on Innovation Activity in Manufacturing is based on the Second Community Survey and the recommendation of Oslo Manual and EUROSTAT. In 1997, the data was collected for the period 1994-1996 and in 2000 for the period 1997-1998.

The census on Innovation Activity in Manufacturing is based on the Second Community Survey and the recommendation of Oslo Manual and EUROSTAT. In 1997, the data was collected and published for the period 1994-1996 and in 2000 for the period 1997-1998. The plan is to conduct this survey on a regular basis every two years. The next survey will be conducted in 2002 and will be based on the Third Community Survey.

The census on Innovation Activity in Selected Services was first introduced in 1996 as a pilot census. The first data for innovative activity in selected services 1998 were published in 2000. The census is now conducted on a regular basis (every two years) and the next is planned for 2002. The services were selected under the recommendation of EUROSTAT.[20]

Data on patenting is regularly collected by the Slovenian Intellectual Property office (SIPO), an agency of MST. SIPO prepares the patent, trade-marks and industrial designs records according to the methodology of WIPO. Collected data is made available to the Statistical Office and also published in annual SIPO reports (http://www.sipo.mzt.si/STATIST.htm.).

Ministry of Science and Technology collected the data from research organisations financed in whole or partly by MST[21]. The data collected refers especially to the spending of resources (basic, applied and developmental research projects; young researchers programme, equipment, literature, foreign travel to scientific meetings/conferences, publications, international projects, etc. The evaluation of these data should be the task of the Group for Research and Evaluation of Science attached to Slovenian Academy of Sciences and Arts, established in 1999.

Institute of Information Science (IZUM), founded by the Gov. of Rep. of Slovenia, developed and operates the COBISS system (Co-operative online Bibliographic System and Services) as well as SICRIC database (Slovenian Current Research Information System).

Among non-governmental institutions, collecting data on innovation activity, Institute for Economic Research has the most impressive record of systematic data collection.[22] Various other research institutes, associations of enterprises and individuals conduct occasional surveys and interviews in the area of

[20] These are enterprises in following activities: electricity, gas and water supply; wholesale; transport; telecommunications; financial intermediation, architectural and technical consultancy.

[21] It is expected that the same activity will now be performed by Dep. of Science at the Min. of Education, Science and Sport.

[22] IER has in the last five years conducted two major studies: the technological level of Slovenian manufacturing sector and the innovation capability and technological intensity of the Slovene service sector.

technological development and innovation activity[23], but each according to its own methodology and usually without any/much cross-referencing.

A new mechanism for collecting and disseminating information on innovation in Slovenia is provided by the Slovenian Chamber of Commerce and Industry, which established Business Opportunity Exchange System on the Internet[24]. Slovenian and foreign firms are invited to enter offers and demands and search the data base for information and seek partners. Among several areas[25] the system also incorporates data base on of patents/licence/innovation/technology.

1.5 Legal and administrative environment for innovation

Slovenia offers investors relatively favourable policy environment. The adoption of the Company Law in 1990 gave a strong push to the creation of new enterprises, especially small-scale firms. Initially a very low starting capital was required to set up Limited liability company and this led to growth of new business at the rate of cca 50 new companies per day registered by the courts. The minimum level of starting capital has since been progressively raised and the creation rate of new firms gradually normalised. [26]

The Companies Act provides for the following types of companies and partnerships in Slovenia:

- Partnerships:
  - Limited partnership
  - General partnership
  - Silent partnership
- Corporate forms:
  - Joint stock company
  - Limited liability company
  - Limited partnership by shares

[23] e.g. the Questionnaire on innovation activity prepared by the Technology Development Department and the Committee for Intellectual Property and Innovation Activity of the Chamber of Commerce and Industry.

[24] http://www.gzs.si/eng/borza/index.htm

[25] offers/demands, agency, business cooperation, financial cooperation, business premises, sub-contracting, joint ventures, production cooperation.

[26] Data on annual birth/death rate are available according to NACE-Rev.1 activities, which does not provide for specific data on NTBFs. Data are produced by the Statistical Office of the Republic of Slovenia on the basis of Slovenian Business Register. According to the latter, the average number of new firms established in the first half of the nineties was approx. 10,000 annually, while it decreased to approx. 2,000 in the second part of the nineties.

While in the cases of partnership the founding capital is replaced by the unlimited liability of the partners, the law sets the minimum founding capital for corporate forms.[27]

Slovenian investment legislation and regulations allow domestic and foreign investors equal rights to enter and exit businesses and they provide adequate investment protection. Slovenia has liberalised its foreign exchange regime, which allows free transfer of profits and repatriation of capital. It is ranked as one of the most tax-favourable countries in Europe, with the company tax set at 25%.

As already mentioned in the chapter on fiscal/tax policy no special measures or legislative acts directly influencing the potential for business to engage in innovation, exist. In principle, the Ministry of Finance argues that it will not support any favouritism via special tax measures for any sector or any activity, since to respect fully acquis means no subsidies or tax relieves should be granted. Tax incentives focus on stimulating employment of first-job holders, those registered with the employment agency, older or handicapped people. Also, taxpayers are entitled to a deductible allowance amounting to 40% of the financial resources invested in tangible assets and long-term intangible assets, but this may not exceed the amount of the taxable base. Investment reserves for investment in tangible and intangible assets and long-term portfolio investments in Slovenia may be deducted up to the amount of 10% of the taxable base. (see details in Investing in Slovenia, 2001)

On the other hand, the government is concerned with low attraction of Slovenia for FDI and small role FDI have played in the transition process in comparison with some other CEE countries. One of the key documents in this respect, which is quite illustrative also for the purpose of this analysis, is a study prepared by FIAS on administrative barriers to investment in Slovenia (FIAS, April 2000). Some of the recommendations of this study were integrated in the government programme for the promotion of FDI in the year 2000.

[27] For the first quarter 2001, joint stock company: minimum founding capital is SIT 4,100.000.00 (cca 19,250 EUR) of which at least one third must be contributed in cash.

Limited liability company: minimum-founding capital is SIT 2,100.000.00 (cca 9,860 EUR), of which 1,100.000 (5,160 EUR) must be paid on founding, and at least one-third in cash.

FIAS found that in number of areas, including tax administration and customs procedures, aggressive policy and procedural reforms in conjunction with the efforts for EU accession have already resulted in simple, transparent and well-functioning sub-systems of the current investment process. Other areas where few complaints were heard include industrial property rights and standardisation procedures – both fields have been strongly shaped by EU harmonisation and have had new legislation put in place.

Areas where few complaints were heard include industrial property rights and standardisation procedures – both fields have been strongly shaped by EU harmonisation process.

There is a need for further simplification or fine-tuning of several areas, including the procedures for establishing business (registration at court, business activity permit[28]) and those for the foreign exchange transaction reporting requirement.

What should be of key concern for the administration are the areas in which major obstacles to investors can be identified. These include the procedures involved in acquiring land for investment purposes, obtaining the various site development approvals, obtaining expatriate work permits, and hiring and firing employees. Problems in these areas, especially the protracted time and uncertainty associated with the process, seriously impede investments (FIAS, 2000).

There is a need for further simplification or fine tuning of several areas, including the procedures for establishing businesses.

Let us look at some of these barriers in more detail, since some are especially relevant for SMEs or high tech firms. One of frequently quoted bottleneck for greenfield investment in Slovenia is the issue of acquiring land and consequent site development approvals. High land prices, complicated and risky process of land transaction registration, which can take up to two years or more, slow re-zoning[29] , followed by even more complex and lengthy process of obtaining building permit, discourages potential investors. Development of industrial parks could be a medium term solution, but even city municipalities have often difficulty in providing the suitable plots. There are examples where innovative and flexible municipal policy in developing small-scale industrial parks for SMEs have attracted several businesses to locate in the outskirts of the capital,[30] but there are many more "horror" stories

[28] All businesses in Slovenia must obtain a Business Activity Permit before they can start operation. To apply for the permit, the companies must submit to Local Offices of State Administration a number of documents, including copies of various registrations, location permits, building operation permits, sanitary and work safety inspection certificates, staff qualification evidence etc. The issued permit specifies the business activities the company is allowed to carry out. According to FIAS as well as many other experts, this permit is a mere bureaucratic process with no added value either to investors or the Government.

[29] Slovenia has extremely slow, rigid and complicated process for re-zoning agricultural land for industrial use and commercial development, sometimes even plots within town limits and next to industrial establishments are still classified as agricultural lands.

[30] A good example can be found only few miles out of Ljubljana in Obrtna cona Trzin where mostly SMEs have found their place, but from very different industries: some IT companies, auto-dealers, service providers, traditional craftsmen, etc.

Areas in which major obstacles to investors can be identified include procedures involved in acquiring land for investment purposes, obtaining work permits, etc..

of discouraged foreign as well as domestic investors, who had to wait for years to get all the necessary permits to expand their operation.[31]

Current labour legislation and especially regulations concerning employment of foreigners (Employment and Work of Foreighers Act, 2001) are not at all stimulative to SMEs or FDI. Especially the latter was conceptualised with immigrant non-skilled workers in mind, disregarding the fact that skilled expatriate labour could help in catching-up on technical, marketing and management know-how. The work permit application requires excessive documentation including the recognition of foreign degrees by the University of Ljubljana/Maribor. All foreigners go through the same procedures, hand in the same documents, and receive the same treatment. Once all required documents are in place, the approval still takes about one to two months, with no guarantee of positive outcome or possibility of an appeal if denied[32]. These permits and residence visas need to be renewed yearly, so the foreigners are perpetually in the process of applying for them. The same procedure applies for a three months position (for example consultant task) or a full year employment/residence.[33]

The labour legislation is currently being revised so as to be harmonised with EU requirements. Due to the elections in the second half of 2000, the final wording of the Law was postponed, since the changes argued for by Employers' Association are strongly opposed by the Labour Unions. The current wording[34] argues for more flexibility in hiring/firing, more flexible types of employment and offers less protection to employees. Particularly SMEs advocate flexibility, since current system of full-time employees can be very expensive and risky. SMEs argue that with a more flexible system they would be stimulated to employ more and that some of the "grey" economy would be therefore eliminated.

Within the National Employment Programme, special measures are planned to stimulate employment, especially of people currently registered with Employment Services of Slovenia as unemployed and receiving unemployment relief. Current schemes for employment promotion, supported by the Employment Services of Slovenia (ESS) do not segregate the jobs in favour of

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31 One such "story" is Sava Goodyear one, where the building of modern warehouse on the land owned by the company has been delayed for more than two years due to the re-zoning and dispute between local administration and the state one.

32 The employer has to state that no adequate employee could be found in Slovenia, but in case the Unemployment agency has a suitable candidate, the work permit will be denied.

33 Government announced its plan to revise the policy on employment of foreigners with setting a limit of the number of employment permits (% of active population) and simplifying the procedures for obtaining the permits with giving priority to those foreigners with longer residence in Slovenia.

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higher skills. Any employer willing to employ a person listed as unemployed as a full-time regular employee for a minimum of one-year can apply for a subsidy. The availability and the amount of subsidy depends on the resources the Agency has[35], but in principle refunding of contributions (pension and social/health security contributions) is granted to the employer, who employs a person previously unemployed for at least a year.

Also, special schemes are put in place for self-employment, with financial assistance at the start of operation (non-returnable and returnable funds). More attention in the new programmes is given to education and counselling for facilitation of self-employment of the unemployed than to the financial subsidies.

To stimulate the growth of new firms an anti-bureaucracy programme was conceptualised in late 1999 in the framework of the National Action Plan for Employment 2000-2001 (as already mentioned within the chapter 1.1 on SMEs Policy). Its main objective is to shorten the period for the establishment of new firm and to eliminate all administrative barriers hampering faster growth of SMEs. To that end one-stop shops would be established to help entrepreneurs in setting up business. One of the main difficulties in executing the programme so far seems to be poor co-ordination among different ministries and related government bodies (Autumn Report, IMAD, 2000).

To stimulate the growth of new firms an anti-bureaucracy programme was conceptualised in late 1999 in the framework of the National Action Plan for Employment (2000-2001).

[35] It is better to apply at the beginning of the year, since at times it happened that all of the funds reserved for this purpose were spend by mid-year.

Section 2 - Measures to foster innovation in business

2.1 Training and human resource programmes in favour of innovation

Slovenia experienced a growth of different management training programmes in the beginning of the nineties.

The relative success of such programmes reflects a recognised need in Slovenian business for improvement of management skills and growing awareness of importance of life-long training and education for top managers.

As most CEE countries, Slovenia experienced a growth of different management training programmes in the beginning of the nineties. Both Universities offer MBA programmes[36], some programmes have been initiated with the co-operation of foreign universities and some developed by semi-private education institutions. Programmes are very diverse and it is hard to assess the direct content relevant for the innovation, but the main connotation of all programmes is the introduction of the modern (Western, mainly American) management techniques to business practice. The innovation studies per se at the M.A. level are part of the curriculum at the Faculty of Economics and Business at the University of Maribor. Also, a strong focus on multidisciplinarity of curriculum and on innovation studies as a special segment is given at Politehnika, a separate[37] higher education school set up in Nova Gorica by the Institute Jože Štefan, local community and business enterprises, financed via tuition fees, some government cofinancing and scholarships provided by business sector.

Many other programmes of management education are being offered to Slovenian business, not necessarily connected to the formal education institutions. Some business groups have launched their own MBA programmes[38] in co-operation with different partners from abroad. Some of the programmes receive government support (for example Gea College runs courses for

[36] The Faculty of Economics at the University of Ljubljana and The Faculty of Economics and Business in Maribor.

[37] Not being a part of the either of the two Universities.

[38] Aktiva Group is one such example. The MBA programme run jointly with couple of American universities, offered first to their managers, has been opened not only to Slovenia but to the region.

managers of SMEs, which are partly run in co-operation with Babson College, USA), but mostly they are financed via tuition. The relative success of such programmes reflects a recognised need in Slovenian business for improvement of management skills and growing awareness of importance of life-long training and education for top managers.

Table 6 - Main organisations involved in human resource development for innovation

Higher or further education organisation	Main type of innovation related training or advisory services	Commentary	Involvement in networks
Faculty of Economics at the Uni. of Ljubljana	M.B.A. programmes, business consultancy in change management and ERP, special business – focused short courses	Focus on modern business techniques, strategic management, IT in business applications, ERP, etc.	Faculty is in the process of international accreditation, it runs jointly with The Centre for Development of Enterprises an International MBA programme in Slovenia and India
Faculty of Economics and Business, University of Maribor	Undergraduate and MBA programmes, special seminars, conferences, short-term training	Focus on innovation management, ERP, new business techniques, TQM, etc.	Some of the programmes are co-financed by different Ministries, Regional Development Agency and Chamber Commerce and Industry
Bled School of Management with International Executive Development Centre	Top executive MBA programme, specific programmes for individual companies, specialised training for executives	Executive-style management education for executives and high potential young managers	Headquarters of the Central and East European Management Development association (CEEMAN). Co-operation with INSEAD, UNESCO, EU, EBRD etc.
Politehnika	Undergraduate and graduate studies in technological development and environmental studies	Strong focus on multidisciplinarity: combination of social sciences (economics) and technical studies, special innovation programme	International Board of Directors
High School of Business and Management	Undergraduate programme in economics	Focus on business skills for successful running of SME	
College of Management	Undergarduate programme in management	Focus on business skills, including innovation in production and ERP	
Centre for Technology Training, Chamber of Commerce and Industry	Training in the field of quality management, including the introduction of ISO 9000 and ISO 14000 for SMEs	Focus: technical standards, internal quality assessment, R&D school	

Slovenia has developed a unique strategically oriented "Young Researchers" programme, initiated and co-ordinated by the former Ministry of Science and Technology. It focuses on training and education of young researchers (M:A: and Ph.D. students as well as postdoctoral specialisation/projects). The Ministry finances the participants indirectly by refunding their set salary and mentor's fee to the institution (institute, university research departments). Since its inception in 1985, this has been one of the most successful programmes, receiving approximately 20% of the Ministerial budget. It has contributed substantially to the quality of research and to the increasing number of young researchers in research teams at research institutions. Under the current financing scheme of R&D activity (fixed research teams[39]), this programme is the only method of entry for young people into research field.

Initially, an important objective of Young Researchers programme was also to provide for the mobility of researchers from the industry to the research institutes (to complete the education) and back. This part was not as successful: particularly the very best stayed with the research institutes. The relative concentration of researchers in the public research sector versus business R&D departments is recognised growth impediment. In order to address this issue, The Ministry of S&T introduced a programme of subsiding to the enterprises part of the salary for the newly employed Ph.D. and M.Sc. graduates in enterprises.[40] Additional mobility scheme is a part of the "law on support….", but is, as other programmes within this Law, put on hold until the implementation provisions of the Law are prepared. Some of the experts warn that while additional stimuli in terms of subsidies is welcomed, the real growth of R&D employment in enterprises has to come from within the business sector: once the majority of enterprises will start the process of technological restructuring (not just passive restructuring via elimination of loss making activities) with new development cycle, they will need their own R&D personnel as well as closer ties with research institutes. This statement can be confirmed in those enterprises where the new growth cycle has already begun.

Experts warn that while additional stimuli in terms of subsidies is welcomed, the real growth of R&D employment in enterprises has to come from within the business sector

[39] The teams can be composed only of Ph.D. researchers, with a certain percentage of FTE of each team member dedicated to the services team needs by assistant researchers or technical support people.

[40] This progarmme is also moved to ME, but is expected to be run jointly with MESS.

Table 7 - Main initiatives taken in favour of human resources development for innovation

Organisations responsible	Objectives	Target public	Funding
Ministry of Labour Social Affairs and Welfare, Employment Services of Slovenia	Improve the employability via providing additional training (computer literacy, languages, basic management courses, setting up small business, etc.)	Currently unemployed	State budget
Ministry of Education, Science and Sport	Upgrade the R&D personnel (see more details in the text)	Young researchers	State budget
Ministry of Economics and Chambers of SMEs	Increased management skills in SMEs	SMEs managers	Cofinancing (partly state supported education programmes
Local communities via regional Development Agencies	Promote entrepreneurship in local communities	Unemployed, general public	Local communities' budget

The Employment Services of Slovenia, legally set up as a public institution, connected to the Ministry of Labour, Social Affairs and Welfare, provides different services to unemployed persons, including various forms of training and education for unemployed (See also section 1.5.). Training and back to work programmes for unemployed have two key targets:

- To motivate and inform unemployed people in order to increase their active engagement in seeking employment, assistance in identification of professional goals an development of personal skills and abilities for more efficient performance on the labour market.
- Adjustment of knowledge, skills and abilities of the unemployed person to the staffing needs and of technological development.

Of the total budget of ESS in 1999, 23.4% went for employment programmes, and within these the highest amount was dedicated to functional training (48.3%), followed by programmes leading to qualification (27.6%) and on-the-job training (21.9%). ESS provides specific counselling and training programmes for those wanting to start their own business (self-employment programmes). They organise informative seminars, finance introductory forms of training and individual counselling.[41]

[41] In 1999, approx 6300 people participated in various programmes for self-employment.

A six-year Computer Literacy Development Programme was launched in 1994 and concluded in 1999, focusing primarily on elementary schools. Based on the success and experience gained, the Ministry of Education, together with newly established Ministry of Information Society plans to continue the computer literacy development programme and expand it particularly for the adult population.

With the financial support of Phare funds a handbook "Innovativeness for the Youth" was published.

The handbook systematically deals with different dimensions of innovativeness, to build innovation awareness during the entire education process.

Due to dynamic growth of knowledge and its fast obsolescence adult education is of utmost importance for the creation of innovation conducive environment. Slovenian Institute for Adult Education (SIAE) was established in 1991 to foster the development of a culture of life-long learning and education in Slovenia. SIAE collects annual data on both providers and programmes of adult education and training.In the school year 199/2000, 186 adult education organisations offered 3,283 adult education programmes (National Observatory Country Report, Slovenia 1999). Wide availability of adult education and training programmes has yet to attract more participants: according to a recent survey of SIAE, as many as 90% of people with elementary school education and nearly 80% of those with vocational school education do not participate in any form of adult education.

In 1996, the SIAE introduced *Life long learning week* action with the aim of raising public awareness concerning the importance, necessity and omnipresence of learning[42]. This event is now being held annually and providers of adult education programmes organise "open houses" to demonstrate the content and the teaching methods. At present, National programme of adult education is under preparation with the principal objective to increase the share of population (above 15 years) engaged in general education programmes to 60 percent.

An interesting initiative towards awareness building on innovation was realised in 2000 with the financial support of Phare funds (Phare Mocca). The handbook "Innovativeness for the Youth" was published and is intended for teachers of technics and mentors of interest activities in elementary schools. The handbook systematically deals with different dimensions of innovativeness, from the basic concept to the institutional support for innovations. It also refers to innovativeness in schools and in education system in general, to learning society and presents cases of youth and adult innovators. The above initiative points to the importance of introducing basic knowledge on innovation and culture of innovation at the early stage of education so as to build the innovation awareness during the entire education process.

[42] For more information on the action see http://www.acs-saec.si/llw/.

2.2 Awareness and use of innovation management techniques

In privatised enterprises the awareness of innovative management techniques and tools is rather good when privatised enterprises are taken into account. The situation is even better in enterprises engaged in strategic partnerships or other alliances with foreign partners.

In Slovenian business community the awareness of innovative management techniques and tools is rather good when privatised enterprises are taken into account. The situation is even better in enterprises engaged in strategic partnerships or other alliances with foreign partners. Non-privatised enterprises in the portfolio of Slovenian Development Corporation and SMEs are in worse position, the former due to preoccupation with survival issues and the latter due to scarce financial and human resources. Although this general statement refers mainly to ISO standards and quality certificates, recently also the awareness of innovation per se is growing (See also Box No.1 and No.2). Technology audits are performed mainly at the level of manufacturing branches and only rarely at the firm level (only in best enterprises).

Surveys reveal that quality management was the top priority of Slovenian enterprises but that innovation processes are taking the lead in the future.

ISO standards and quality certificates are the most widely used innovative management techniques among Slovenian enterprises. Consultants estimate that both are necessary for the standardisation of processes, for improvement of quality and of efficiency of firms, however they are not sufficient to deal with organisational changes. The analysis of the introduction of ISO standards to SME[43] shows that they have not yet decisively influenced the competitiveness of enterprises. However, the experience of some enterprises shows that introduction of ISO standards represents a solid foundation for the renovation or rationalisation of processes and a stimulus for introducing further innovations (e.g. environmental standards-ISO 14001, social responsibility standards-SA 8000, health and safety standards-OHSAS 18001), total quality management, self assessment, business excellence, 20 keys method and other innovation management techniques. This is further illustrated by the shift in priorities in organisational changes by SMEs. The above mentioned analysis on the introduction of ISO standards to SMEs reveals that in 1997/98 quality management was the top priority of Slovenian enterprises while innovation in processes is taking the lead in the future[44].

[43] Pivka, Uršič, 1999 (The impact of ISO 9000 on the competitiveness of SMEs).

[44] Ibid.

Table 8 - Main initiatives taken in favour of IMT diffusion

Organisation responsible (initiator and management structure)	Objectives (e.g. awareness-raising, training in techniques)	Target public (e.g. SMEs, specific sectors, etc.)	Funding (level of funding, source: public/private)
MEA, MSMEs, MST, Chamber of Commerce and Industry, Chamber of Crafts	Awareness building on quality, training for ISO standards introduction	SMEs	Co-financing of up to 50 percent of costs is available after the acquisition of ISO certificate[45]
MEA, MSMEs	European Quality Award		Co-financing of application costs for the European Quality Award

The prevalence of ISO standards and TQM in Slovenia so far can on one hand be attributed to market pull determinants and on the other hand to supportive environment for the introduction of quality standards. In the beginning of the nineties, Slovenian enterprises were faced with the necessity to increase their sales to developed countries markets to compensate for the loss of ex-Yugoslav market. Accordingly, they had to improve quality and acquire quality certificates to meet the requirements of their partners[46]. Chamber of Commerce and Industry played very active role in educating managers in the area of quality certificates. This activity was later taken up also by regional chambers of commerce and industry, diffusing also the experience of enterprises in the related area. As a result of the above factors a strong push was given towards the introduction of ISO standards first in manufacturing and later also in services. Recently, ISO standards are paving their way to public institutions and government administration as well[47].

Large enterprises were the first to introduce ISO standards, while SMEs joined latter, with favourable environment. The Government and associations of enterprises realised that many enterprises, especially SMEs are not able to cope with the introduction and implementation of ISO standards. As a result, co-financing schemes for the introduction of ISO standards were established and supported by the Ministry of Economic Affairs, Ministry for SMEs, Development Corporation of Slovenia, Ministry of Science and Technology, Chamber of Commerce and

[45] This measure was in place till the end of 2000. In 2001, this mechanism has eroded significantly, due to the exit of Chamber of Crafts from the scheme and the closure of the Ministry of SMEs. The partial refund of ISO project costs (less than 10%) is still provided by Chamber of Commerce and Industry, while Min. of Economy offers subsidies for this purpose within general scheme of subsidizing programmes to increase competitiveness in business sector via public calls.

[46] According to interview approx. 1/3 of the total number of ISO standards was introduced due to requirements of foreign partners.

[47] Slovenian Chamber of Commerce and Industry has also acquired ISO standard.

Industry, and Chamber of Crafts, which also included subsidised training. 120 SME took part in the respective schemes of ISO standards introduction.

Dissemination of ISO standards "drive" was additionally stimulated through universities curricula, specialised training courses and through Slovenian Award of Business Excellence. Also, Chamber of Commerce and Industry established Slovenian Association of Quality which is a non-profit organisation. Its principal aim is to encourage the introduction of quality and business excellence to businesses. Recently, the trend towards quality also gained support through advertising campaigns in business journals which publish supplements on quality management.

ISO standards introduction became the most popular trend in management change in Slovenia in the nineties, joined later by TQM. As a result, approx. 1050 enterprises have acquired ISO standards so far in Slovenia (end May 2001), accounting for one third of employment in the corporate sector. Although the drive towards acquisition of ISO standards was beneficial in terms of improving standards of operations and quality management the interview in the Technology Development Department of the Chamber of Commerce and Industry revealed that excessive attention might have been paid to ISO standards, possibly also to the detriment of introducing innovation. Consequently, the above mentioned department recently shifted its orientation from ISO standards and the support of the exhibitions of innovations to stimulation of innovation activities in enterprises per se. Its experts believe that awareness among enterprises of the need to encourage innovation is growing. Also the view was put forward that the adoption in 1999 of the Law[48] supporting innovation and industrial R&D, was the result of strong pressure of enterprises to encourage innovation.

As a follow-up action of the Technology Development Department and the Committee for Intellectual Property and Innovation Activity of the Chamber of Commerce and Industry, the questionnaire[49] on innovation activity was mailed to enterprises. The information obtained through the questionnaire shows that approx. 60 percent of large enterprises engage in innovation, be it professional innovation or general innovative activity[50]. However, enterprises need help in promoting innovation activities either in terms of training or in terms of

[48] Law on Support for Enterprises in the Development of New Technologies and Establishment and Operation of their R&D Units in the period from 2000 to 2003.

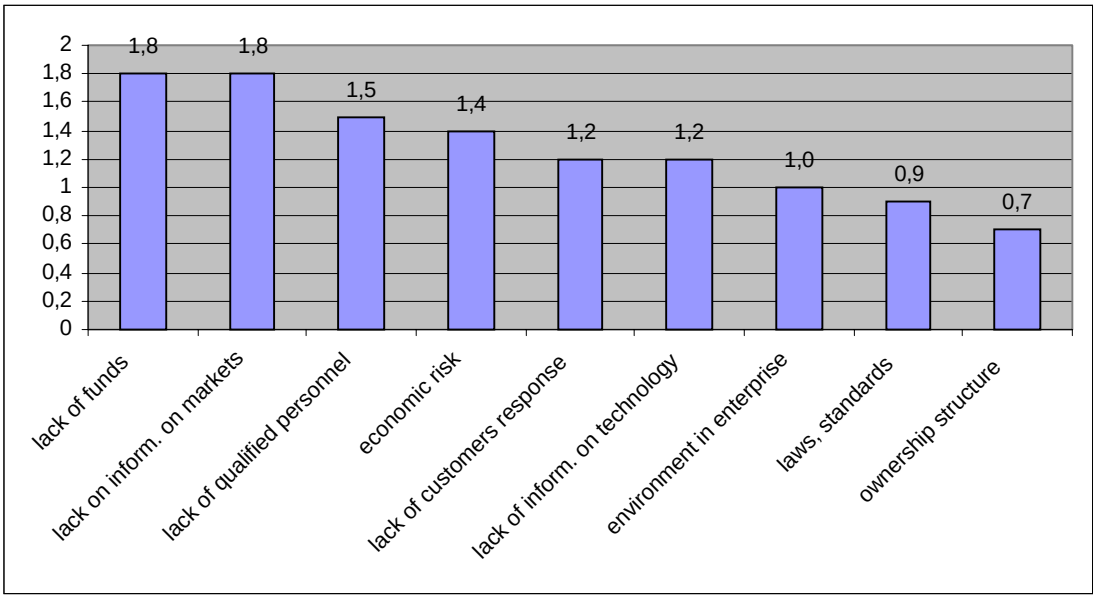
[49] "Questionnaire on innovation activity" was mailed to 500 larger enterprises covering all activities. The response rate was 47 percent. (Analiza stanja inovacijske dejavnosti po slovenskih podjetjih v letu 1999, 1999).

[50] The percentage of enterprises undertaking innovation should be interpreted with caution since it concerns only large enterprises.

establishing links with enterprises which have experience in innovation. Accordingly, the Technology Development Department organised first workshop for enterprises aimed at awareness building on innovation. The cases of successful innovatory practices presented by enterprises proved to be the most interesting and useful for participants. The objective of the Technology Development Department of the Chamber of Commerce and Industry is to broaden their activities related to innovation to regional chambers of commerce.

To summarise, the chart bellow points to the most critical factors hampering innovations in manufacturing activities which were to a large extent also identified in interviews (Chamber of Commerce and Industry, Slovenian Business Innovation Network, enterprises).

Chart 1: Factors* hampering innovations manufacturing activity in Slovenia, 1998



*0=not important
1=less important
2=important
3=decisive

Source *Innovation Activity in Manufacturing, Slovenia, 1998, Rapid reports, No. 81, 2000, Statistical Office of the Republic of Slovenia.*

To promote innovation activity within business enterprises, different schemes have been elaborated. From analysing them, it can be concluded that only systematic and professional approach to innovation promotion brings results, which in fact can be quite impressive (see Box 1. on Adria and Box 2. on ETI).

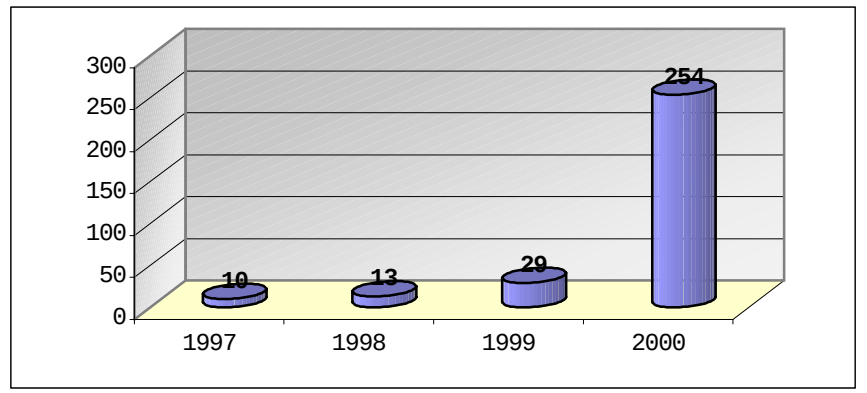
Box 1 - Approach to Innovativeness in ADRIA MOBIL

Adria Mobil, producer of campers and mobile homes was established in 1995 after its predecessor's bankruptcy. The share of exports in total sales accounts for 95 percent, with 6 percent share of the European market. Since 1995, the number of employees increased from 202 to 510 at the end of 2000, mainly due to demand growth on the European market. Dynamic growth of the firm created conducive environment for reviving the innovation activity within the firm. The shift to innovativeness in 1997 was additionally supported by the introduction of internal acts and organisational structure favouring innovation. Major action was launched in 1999 and further developed in 2000 when a person for innovative activity was recruited. Already as a student of management school she prepared a survey among the employees concerning the present state of innovativeness. As a result, proposals for further development of innovative activity in the firm were put forward and accomplished accordingly in 2000.

In the first phase, the regulation on innovative activity was modernized to enable more flexibility and to be better adapted to employees' needs. The rewards for inventive proposals were expanded to include four types of non-calculable inventive proposals, as well as formula for calculable inventive proposals. Additionally, every inventive proposal is rewarded with minimal amount. Employees were informed about the changes through the education programme implemented within the firm. Two booklets were prepared on innovative activity and distributed to all employees and are also given to new employees. Commission for innovative activity comprising representatives of every sector of the firm regularly examines inventive proposals. Authors of innovative proposals and rewards are publicly revealed. Innovator of the year is also selected and awarded.

The above framework provided for strong push to innovative activity and resulted in steep increase in the number of inventive proposals in 2000 as shown below.

The number of inventive proposals, 1997-2000



The majority of inventive proposals come from production units. In 2000, inventive proposals contributed to weight decrease of final products (which is very important for mobile homes and trailers), to lower costs for inputs, shortened production cycle, elimination of defects, improved quality of products and improved safety at work. These improvements have increased value added and quality of the product. Equally important is the fact that employees feel they can actively participate and contribute to higher quality of products and quality of firm's performance. As innovative activity in administration and supporting services lags behind that in production there is a plan to encourage it in 2001. Consequently, innovation statute will be supplemented to include business innovation as well.

Box 2 - ETI's Innovation Scheme

As a specialist producer of all types of household and industrial fuses ETI established its position on a global market, since nearly 80% of revenues (total revenue 1999 34 mio EUR; 1008 employees) are realised in export. This requires constant investment in new technology, research and development as well as in human resources. Annually 8% of total revenue is invested in R&D, especially in the field of technical and engineering ceramics and tooling.

The first Rules on innovation and technical improvements was introduced already back in 1968, to be adjusted to new circumstances in 1989 and again in 2000. The history of different innovation supporting measures have shown that only a systematic and professional approach to innovation pays off. Today, ETI differentiates two level of innovative process: one is a professional R&D department, which collaborates extensively also with outside researchers and the their is so called »Mass Innovation Scheme, focused on all employees. At the start of year 2000, management decided to name a professional Innovation Manger, solely responsible for the promotion of mass innovation. After adjusting the regulations and simplifying the reporting and awarding procedure, an impressive growth in the number of new ideas was realised (more than 60 suggestion in two months; total of 89 for the year 2000). Till the end of the year, 39 of the suggestions were assessed and processed with 41 mil SIT savings realised only in 2000! During the first quarter of 2001, 38 suggestions were evaluated and 29 awarded, with estimated 9,3 mil SIT savings.

Each proposal is entitled to a symbolic 3000 SIT award automatically. It then enters the evaluation process and the innovator can be awarded 5-20% of total savings achieved if innovation is implemented. In case no direct cost benefit can be measured, an ward is decided by the evaluation group. Other stimulating measures are also used like education trips to other companies, Innovator of the year award presented to the best five innovators on a special Innovator day, priority in further education financing is given to innovators, public recognition, etc.
The Innovation Scheme was introduced to the employees via internal newsletter and special training organised for middle level management. New system incorporated fully the suggestions and comments by employees and ex-innovators (special questionnaire was prepared for each group). Long-term ambition of the management is to achieve 1 proposal for ten employees.

(1 EUR = 205 SIT; average 2000)

Section 3 - Business innovation interfaces and support measures

3.1 Research community - industry co-operation

The cooperation between industry and research community has been a subject of major criticism of Slovenian R&D policy. A number of evaluators, Slovenian and foreign, have found the lack of links between the two communities as the key deficiency

The cooperation between industry and research community has been a subject of major criticism of Slovenian R&D policy. A number of evaluators, Slovenian and foreign, have found the lack of links between the two communities as the key deficiency, pointing out the fact that while the total amount of public funding of R&D is not critical[51] , the actual impact of public R&D on the technological development in industry is poor. This is refelected also in drop of research personnel in the research institutes and universities, involved in development research projects, expressed in FTE: if in 1991 such projects amounted to 800 FTE, in 1998 the figure was only 350 FTE. (IER, 2000).

One of the prime objectives of the Law on support of businesses is exactly promotion of closer links between research and business community to foster technological development and innovation. Different types of programmes and incentives were elaborated, a coordination of different ministries established, but the fact remains that financing of the activities is tied to the so called B-budget. This makes a figure of 13.3 bn SIT (67,5 mill. EUR) dedicated in principle to all of the proposed subsidies a "wishful thinking" rather than the reality. In reality, 1,7 bn SIT (8,63 mill. EUR) is dedicated in the budget of 2001 to the programmes of technology development now run by the Ministry of Economy (by the same team and with practically the same spectre of activities as previously at the old Ministry of Science and Technology: see Table 9). The expected qualitative difference between the programmes and their execution should come from better coordination between different departments of now single Ministry (combining the activities previously run by Min. of S&T, Min. of SMEs and Min. of Economic Activities) and other

[51] According to The World Competitiveness Yearbook 2000, Slovenia is ranked 14 as to the percentage of GDP dedicated to public R&D, above USA (20) and much higher than other countries from Central and Eastern Europe – Czech Rep: 26; Hungary 28, Poland 29. However, Slovenia deteriorated its rank from 36 to 40 in the integrated indicator of science and technology composed of broader aspects, such as linkages between science and business community (technology management) and general environment for science.

participating Ministries (especially Ministry of Education, Science and Sport and Ministry of Labour and Social Affairs).

Table 9 - main initiatives taken in favour of research – industry co-operation

Organisations responsible	Objectives	Target public	Funding
Ministry of Economy Dep. for promotion of technological development	Support of projects of product/services development	Business enterprises, R&D institutes in cooperation with business	State co-financing up to 25%
Ministry of Economy Dep. for promotion of technological development	Promotion of development and support to technological parks and centres (regional and by sectors)	Business enterprises, local communities	Co-financing of infrastructure costs
Ministry of Economy, Dep. for increasing competitiveness of Slovenian industry	Promotion of clusters	Business enterprises, R&D institutes, knowledge providers	Co-financing of network costs
Ministry of Economy Dep. for promotion of technological development	Support to establishment and development of R&D units in industry	Business enterprises	State co-financing of researcher's costs
Ministry of Economy Dep. for promotion of technological development	Promotion of industrial research co-operation in EU projects, co-financing of EUREKA projects; technology foresight	Business enterprises	Co-financing of project preparation costs
Ministry of Economy, Dep. for increasing competitiveness of Slovenian industry	Promotion of integral approaches to productivity increase (systems of continuous improvement, benchmarking, flexible management, etc.)	Business enterprises	Co-financing of development and introduction costs

The last three programmes in the Table 9 are focused on compensating some of the costs the business enterprise might have in involving research institutions: the subsidy pays for the part of the salary of the researcher, coming from a research institution to the enterprise to set up R&D unit, covers part of the research institute's cost for preparing a project proposal jointly with the business enterprise (EU projects) or the cost (fee) charged by the research/ consultancy institution to the enterprise for putting in place systems of CI, or ERP or executing the benchmarking. [52]

The prevailing small size of research institutions "prevents" the development of a more systematic approach to cooperation with industry.[1] Such fragmentation makes it very difficult also to monitor, assess and analyse the extend, content and quality of such cooperation.

Industry and R&D sector cooperation is partly supported also via different special units within R&D institutions. Especially common is establishment of special Institutes or Centres within Universities, which focus primarily on cooperation with business

[52] In fact, we could say that these programmes, especailly the last one, don't exactly stimulate cooperation between R&D sector and industry, but encourage business to focus more on innovation, including business innovation.

sector. Professors and researchers offer their consultancy/ research services in their area of expertise to different companies. In some research institutions, they have special units who specialise in developing such links (i.e. Jozef Stefan Institute has an Office for Transfer of Technology), but more common practice is that this is rather individualistic. In fact, as the analyses of the Researcher's Association points out, the prevailing small size of research institutions "prevents" the development of a more systematic approach to cooperation with industry.[53] Such fragmentation makes it very difficult also to monitor, assess and analyse the extend, content and quality of such cooperation.

One of the reasons for the decline in cooperation between research community and business, stressed by researchers themselves is the current evaluation system with strong emphasis on publications and citation index. Applied research or contacts with business are not given sufficient recognition and can even "harm" someone's reputation. In some instances it is possible to find experts who work closely on rather sophisticated projects with industry but are at the same time not permitted to teach on the subject at the University, since they have insufficient scientific records (publication of articles). This is being increasingly recognised and within the planned changes of the evaluation criteria a place for proper recognition of industry cooperation is to be introduced and gradually given more value.

Another measure currently debated between the Ministry of Economy and Ministry of Education, Science and Sport is a special spin-off programme, which should promote the researchers/teachers at the University to set up their own enterprises. Roughly, the scheme is expected to provide an option of re-entering the education/research institution at any time within a period of two years. This would help to decrease the fear of failure on the market.

In the past, Ministry of Science and Technology had commissioned different evaluation studies of the technology/innovation policy. The most consistent was the evaluation of industrial R&D projects, carried out by the Institute of Economic Research and co-financed by the MST. The evaluation proved that relatively small amounts of resources allocated to such research projects were well justified and had a high return on investment for the Government[54]. A number of other, broader studies (Phare-GOPA, 1994; Coopers & Lybrand,

[53] Only two research institutes employ more than 300 people, 18 out of 70 R&D institutes employ less than 10, and 22 (the largest single number) between 21- 50 employees. The fragmentation is further illustrated by the fact that nearly 800 individual units (be it departments, laboratories, groups, etc.) within Universities and cca 290 units within R&D institues offer their services on the market. (data collected by Researchers' Association, 2001)

[54] The evaluation showed that on each tolar invested into technological subsidies, there is return 8.7 times through taxes and contributions.

1997; EU, 1999; etc.) consistently pointed out weak links between industry and R&D sector, favouring of basic on account of applied and development research and insufficient support schemes for industrial research. Recent studies further reveal that the lack of co-operation between the private sector and the public research institutions and a low level of innovativeness are the main challenges for Slovenia regarding future technological development (Benchmarking Slovenia, 2000 and Stanovnik and Kovačič, 2000).

Recent studies further reveal that the lack of co-operation between the private sector and the public research institutions and a low level of innovativeness are the main challenges for Slovenia regarding future technological development.

The low level of research community- industry cooperation can be partly explained also by the situation in the industry. As already mentioned, the first part of the nineties and for some also the second were characterised by the defensive restructuring: privatisation, dis-investment, lay-offs, market re-orientation… Gradually, offensive restructuring is commencing, focusing on new investment, introduction of new products, establishment of new business links at home and abroad, all these contributing to the need for innovation and therefore also more investment in R&D and readiness for cooperation with research sphere. This cycle can be seen also in Table No. 10: Innovation Activity in Manufacturing. In the discussion with business, it was pointed out that especially intensive export activity gives boost to innovation, since satisfying demanding customers requires continuous upgrading of the products and services.

Table 10: Innovation activity in manufacturing in 1994-1996 and 1997-1998

	1994-1996	1997-1998
Number of innovative enterprises	281	332
Innovation expenditure(billion SIT)	33.6	48.4
Share if innov. expenditure in GDP(%)	1.15	1.5
Share of large enterprises in innovation expenditure (%)	80.1	75.3
Innovation intensity (%)*	3.3	3.9
Number of R&D enterprises	200	243
R&D expenditure(billion SIT)	17.9	21.9

*Innovation intensity is the share of innovation expenditure in the sales revenues of the enterprise

Source: Rapid reports, No. 81, 2000, Statistical Office of the Republic of Slovenia.

3.2 Support for start-ups and new technology based firms

As already mentioned, the adoption of the Company Law in 1990 gave a strong push to the creation of new enterprises, especially small-scale firms, since initially a very low starting capital was required. The minimum level of starting capital has since been progressively raised and the creation rate of new firms gradually normalised.

Both ex-Ministries, Ministry for Science and Technology and the Ministry for Small-Scale Business and Tourism had special programmes for promotion of new enterprises. These activities are now all incorporated into the Ministry of Economics and consolidation of support schemes and their coordination with planned activities of Agency for Regional Development is being worked out. So for the moment (spring 2001), the following initiatives could be identified:

Table 11 - Main initiatives taken in favour of start-ups

Organisations responsible	Objectives	Target public	Funding
Ministry of Economy	Promotion of high-tech firms	Technology parks	Infrastructure costs
Horizonte ventures (private venture capital firm with foreign capital)	Provision of venture capital to NTBFs	New start-ups	Starting capital
Slovenian Development Corporation (SDC)	Promotion of new high tech firms, new production programmes or new services	Open to business sector	Favourable credit lines

The main objective of the parks is to create a favourable environment and infrastructure for the operation of small and medium-size firms, which make commercial use of innovations from the research sphere, to market services and products of new technologies and stimulate the mobility of researchers to entrepreneurship.

Support to NTBF start-ups is provided by the Ministry of Economy via **Technology Parks**. As non-profit organisations, they support development of enterprises with advanced technology and provide help in marketing of their products. Technology parks are partly financed through subsidies of the Ministry of Economy (originally by MST)and partly by selling of the services to the enterprises. The main objective of the parks is to create a favourable environment and infrastructure for the operation of small and medium-size firms, which make commercial use of innovations from the research sphere, to

market services and products of new technologies and stimulate the mobility of researchers to entrepreneurship.

The first Technology Park in Ljubljana was established already in 1992 in the framework of the largest public research institute, which tried to market some of its research achievements through this type of institution. Later it was transformed into independent company, with ownership shared by several research institutes, business companies, a bank and Slovenian Development corporation. In 2000, 32 high-tech enterprises were functioning within the Park, with 226 employees (of which 60% have college education), but over 250 outside cooperating partners. In 2000, the value added per employee exceeded 23,000 EUR (Lesjak, I., 2001).

Štajerski Technological Park, located near Maribor, second largest city, currently provides facilities to 20 companies, but is involved with providing counselling to innovators for the region and coordination of joint development projects of local communities. Also, it serves as a consultant to enterprises and individuals in applying for support at government tenders, preparation of business plans or company registration.

First estimates of the functioning of technology parks in Slovenia indicate that they serve the main goals for which they were established, with two key issues to be resolved in the near future: companies set up in the parks wish to have a prolonged "graduation" period and new land for technology parks to grow needs to be dedicated by local authorities. At both location, Ljubljana and Maribor, integration of the activities of Technology Parks and the Regional Development Agencies with local authorities is established and plans made for further expansion of business premises. The new location should provide more room (currently a problem especially in Ljubljana) for the establishment of NTBFs.

At present only two **venture capital funds** exist. But according to financial journalist (Delo, Dec.2000) a number of new Funds are under preparation and are to be launched in 2001. The longest functioning (since 1994) Horizonte Venture Management Fund is preparing to launch a new Fund with a regional focus (Slovenia, Croatia and Bosnia and Hercegovina). Activa Ventures Fund with 15 million € (domestic and foreign partners) has also become operative in 2001 and is to be oriented specifically to enhancing e-economy development. Slovenian Fund Management is raising another Fund in the value of cca 50 mil US$, with only 10-15% of Slovenian share. It is expected that within the activity of the Ministry of Economics a semi-state: private fund for venture capital will be established as well, focusing specifically on technologically most sophisticated projects. The details as well as the size of this Fund are not yet known.

At present only two venture capital funds exist. But according to financial journalist (Delo, Dec.2000) a number of new Funds are under preparation and are to be launched in 2001.

The mandate of **Slovenian Development Corporation** (SDC) also incorporates the promotion of innovations and transfer of R&D results to business community. In Dec. 2000, SDC has issued its 5th call for public tender providing project financing and favourable loans (500 million SIT=2,37 million €) for SMEs and individual entrepreneurs aiming at introducing different types of innovations (diffusion of innovations, production and marketing of new products and services, establishment of start-ups for new products and technologies, increasing the quality and competitiveness based on new technologies and inventions). The experience with projects funded so far is giving valuable insight in the innovation problems in Slovenia. The criteria set forth by the SDC Board in terms of financial soundness of the projects that can qualify for the loans have proven to be so stringent that only a very small number of medium sized firms can meet. This means that the support for start-ups is left at declaration level. Most of the inventors who come to SDC are people with good technical skills and sound technical part of innovation, but with little or insufficient knowledge of business economics. So they need a lot more than just a loan: they need assistance in preparing a business case or, better, a business partner who will help them turn "the ideas into money". A high level of distrust and unwillingness to share ideas often prevent this "transformation". Also, as pointed out during the workshop on Innovation policy in Slovenia, some of the experts are of the opinion that Slovenian industry is as yet showing a great disinterest and non-flexibility in innovative ideas coming from the outside environment.

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In the first quarter of 2001, the Government launched the initiative to close down Slovenian Development Corporation within this year. No specific solution as to the future existence of the Technology fund has yet been announced.

3.3 Business networks for innovation

The tradition of systematic business networks for innovation is not developed in Slovenia. With the transformation of the economic system and the process of privatisation, many larger conglomerates (which combined a number of different businesses within one company/ holding) were separated into individual legal entities. This process resulted in breaking of the traditional business networks and only gradually we see new business networks emerging, partly stimulated by the official policy as described below.

At the end of 1999, the Ministry of Science and Technology introduced a new mechanism for stimulating development linkages within Slovenian industry by passing a legal act on infrastructure development centres. The act stipulates what kind of centres can be subsidised, and under what terms and conditions. Specially, the distinction between technology parks

and technology centres was made. Accordingly, the activities of the centres should focus on:

- R&D activities for the needs of specific industrial branch
- Assistance in applying for international research funding
- Measurements and testing (with aim to become accredited laboratory)
- Providing information on research and technology developments in specific area
- Publications
- Education and training for the needs of the specific industry branch
- Additional tasks may be entrusted to the centre by its founders.

There are two types of these centres: regional technology centres and sector ones. The financing is left to the arrangement between the founders. In the beginning, Ministry of Science and Technology partly subsidised the operation of such centres, with the expectation that in the long run, R&D institutes and industries, which are interested in their services, will take over the financing of such centre. At the end of 2000, there were approximately 31 branch technology centres operating, with additional 6 being proposed. Also, four regional technology centres had been established, with another four in initial phase. The coordination and the cofinancing of the activities of these centres has now been with the Ministry of Economy.

Box 3 - TECOS

Slovenia has always had a well-developed tools manufacturing, but traditionally organised within large enterprises. With privatisation, a number of tool-making units became independent companies. Their small size (nearly 80% of tool-making companies have less than 10 employees) did not allow for high (or any) investment in R&D, also the needed human resources were not available. This led in 1993 to the initiative to create a technology centre for tool- making. Via a small PHARE project funds were made available for the preliminary study of the focus of such a centre (prepared by Danish Technology Institute), where the management training needs of the tool- makers were stressed as the key priority. The technology centre was to be set up within one of the Faculties, but the industry demanded that the Centre is an independent entity, formed in such a way as to be eligible for subsidies, but not run as a part of public sector.

Today TECOS receives some of its funds as infrastructure subsidy, some via the programme of Young Researchers and some under the applied research projects funding (all together approximately 40% of running costs). But increasing share of the money is coming from the industry as direct payment for the services rendered and via membership fees paid by the participating firms (by end of 2000 more than 70 firms).

Key services provided by TECOS are computer testing, CAD simulation analyses, training and promotion of tool-making industry. The Centre is being equipped with modern computer facilities and highly qualified staff working closely with industry in solving their design and production problems.

From the point of business networks these centres are important since they bring together the enterprises working in the same area (regional centres) or enterprises working in the same sector. The permanent staff of such a centre is responsible for providing the members with relevant marketing, legal and technical information as well as links to R&D facilities, which can either exist within the centre or are provided by a cooperating research institution. As seen from the example of Tecos (Box No.3), such centres can help with providing research/development services which would financially be too demanding for each individual enterprise.

At the beginning of 2001, the cluster initiative of the Ministry of Economy was announced.

The ambition of the Ministry is to promote closer co-operation of different companies as well as R&D institutes in some of the key industries in Slovenia.

At the beginning of 2001, the cluster initiative of the Ministry of Economy was announced. Three different clusters are currently under development as pilot projects for which ME will provide 200 million SIT (approx. 932,000 euro). Pilot projects should be completed in two years and would provide the model of clusters for Slovenia. Selected clusters are: automotive coordinated by Cimos, tool making coordinated by Faculty of Mechanical Engineering of Maribor and transport-logistc cluster coordinated by Luka Koper. The ambition of the Ministry is to promote closer co-operation of different companies as well as R&D institutes in some of the key industries in Slovenia. The cost of networking is to be partly subsidised. It remains to be seen how will this idea from top-down be implemented in Slovenia, where the tradition of networking and co-operation is not developed, in fact we could characterise our business culture as highly individualistic sooner than open to co-operation.

Slovenian Business Innovation Network (SBIN) was established in 1992 by the Minisrty of Economic Activity as one of the sections of Small Business Development Centre. The principal objective of SBIN is promotion and support of innovative activities of small businesses. Partners to SBIN are all national institutions related to innovation activities (different Ministries, Office of the Republic of Slovenia for Intellectual Property, Small Business Development Fund, Chamber of Commerce and Industry, Chamber of Crafts, Slovenian Development Corporation) on one side and around 100 innovators on the other side.

SBIN plays an intermediary role for innovators (predominantly physical persons and independent researchers), for whom it is very difficult, if not impossible (financially and professionally) to struggle on their own through all the phases of innovation process[55]. SBIN provides information and consultancy relevant to innovators (especially how to apply for funds under various schemes), and support in the promotion of their innovations. It is highly relevant for the innovator to know in which phase to apply for patent protection, when to disclose essential

[55] Inventions are predominantly of a technical character.

information about the innovation to potential partners in production, to avoid the danger of abuse of confidential information or copying of innovation, and when the innovation is ready for marketing. The mistakes in any of the phases can be very costly, therefore the assessment process and timing of innovation stages by specialized consultants are of extreme importance for the market success of innovation. The support in promotion refers to the financing of presentation of innovations at specialized fairs abroad and at home, and via the media, therefore enabling innovators to establish contacts with potential partners for marketing of the innovation.

It is highly relevant for the innovator to know in which phase to apply for patent protection, when to disclose essential information about the innovation to potential partners in production, to avoid the danger of abuse of confidential information or copying of innovation, and when the innovation is ready for marketing.

The analysis of the effectiveness of the support provided by SBIN to smaller enterprises related to innovativeness revealed modest results (Božičnik, 2001)[56]. They also show that one out of ten innovative proposals, submitted by the inventors to SBIN was successfully marketed. In carrying out their innovation to production, the inventors used various consultancy and promotion services of SBIN. The interview revealed that the most important impediments for successful conversion of inventions of small businesses into market products are: limited funds for financial support of inventors, serious lack of knowledge related to evaluation and marketing of innovations, deficient entrepreneurship culture and mindset of innovators[57]. In relation to the latter it was also mentioned that building of entrepreneurship and innovation culture in society is a long-term process which should be supported by greater flexibility of education system.

The Programme objectives of Small Business Development Centre (SBDC) for 2000-2001 point to the need of building up an integral system of Government support to innovative activities. Such a system/ institution which will organise and perform innovative activities on the regional level through Regional Business Centres. According to the interview, innovative activities will be introduced to two regional business centres as a pilot project by the end of 2001. The objective is to train a promoter of innovative activity in each region. SBDC is trying to integrate into the system all actors who might contribute to the increase of inventiveness and faster market application of inventions. Also, the SBDC jointly with partners endeavours to establish the Risk Financing Fund, especially for technologically innovative and fast

[56] SBIN provided financial support for the promotion of 727 inventions and innovations at specialised fairs at home and abroad. On that basis 69 business entities were established. At present((spring 2001) 20 firms are successful and employ 188 people.

[57] It is often the case that individual inventors are so confident of the uniqueness of their inventions and emotionally attached to them that they refuse to market them, if large amount of money is not provided to them. For many of inventors an award at international fairs of innovations is valued much higher than succesful marketisation of the invention.

growing enterprises[58]. In 2001, feasibility study will be prepared and it is expected that the risk financing fund could become operative in 2003. The realisation of the project is however pending on the Ministry of Economy securing finance from the budget and also on ME selection of priorities in regional policy and accordingly also of institutions and mechanisms to support it.

Main Findings

Favourable and stable macroeconomic environment in Slovenia in the period from 1996 onwards provided a solid foundation for more active innovation policy. Several policy documents concerning innovation policy were set up and related programmes were launched. However, their implementation is poor and lags far behind the proclaimed policy maintaining low level of innovativeness in Slovenian economy**.** The reasons are manifold and are summarized below.

The cooperation between industry and research community has been a subject of major criticism of Slovenian R&D policy. A number of evaluators, Slovenian and foreign, have found the lack of links between the two communities as the key deficiency, pointing out the fact that while the total amount of public funding of R&D is not critical, the actual impact of public R&D on the technological development in industry is poor. Consequently, relatively high public spending on R&D do not transform to higher value added.

Numerous initiatives, mechanisms and programmes were prepared and even executed, but due to insufficient funds, end effect remains disappointing. In fact, one could say that every suggestion given by consultants or instrument set up in EU countries regarding R&D and innovation policy was in one way or other introduced. However the follow-up activities and functioning of mechanisms introduced was hampered due to lack of resources. Budget allocation to technology development programmes remains inadequate reflecting poor awareness and low priority attributed by decision makers to implementation of innovation policy.

The second characteristic of public R&D spending negatively affecting the innovation activity as well as the cooperation between research sphere and enterprises is favouring of basic on account of applied and development research. Consequently, the research sphere is induced to focus on bibliographical and citation records while neglecting co-operation with industry.

[58] The interview at the Slovenian Business Innovation Network revealed that such risk fund should be reserved to SMEs only. In case it is eligible to all enterprises the larger ones will be the main beneficiaries.

Different legal and policy documents affecting innovation (directly or indirectly) are often in collision with one another and point to the absence of a coherent innovation policy. Lack of monitoring and evaluation of implemented mechanisms and instruments further adds to that. To our best knowledge there is no centralised information system providing data on all existing instruments and mechanisms enabling financial support for stimulating investment in innovation from different sources. This contributes to the fragmentation of funds available and non-transparency of their allocation.

Such innovation policy framework was not successful in extending support to technological restructuring of enterprises, due to the lack of funding and of appropriate mechanisms, which particularly affected the development of technological potential of SMEs. At the end of the nineties, larger enterprises with concentrated ownership structure started to shift from a defensive to offensive restructuring (new investments) while the SMEs could not afford to invest due to deficient financial and managerial backup. Besides, enterprises in general lack human resources with entrepreneurial and innovative spirit. Other framework conditions were not conducive to innovation as well (financial market inefficiencies, fiscal policy, administrative framework and procedures)

Banks remain the major source of long-term financing for the enterprises since the capital market, which would provide for more favourable long-term financing is underdeveloped and shallow. Most banks rely on traditional banking services, while more sophisticated products and services (e. g. investment banking) lag behind. Venture capital funds are only at their infancy.

Fiscal policy is predominantly neutral as concerns innovation. Tax allowance relates to all investment, irrespective of its character, while tax allowance for innovations is provided only within technology parks. This is not sufficient since the potential for innovations extends beyond technology parks. The role of inward FDI in stimulating innovation is limited due to low level of FDI.

Beyond the above mentioned unfavourable conditions for innovation the lack of innovation culture stands as a background impediment to innovation orientation not only in enterprises but also in the public sector institutions and in the administration. To a certain extent this is related to the lack of entrepreneurship in the past economic system and to prevailing value system in Slovenia which prefers certainty to risk taking. This points to the importance of introducing basic knowledge on innovation and culture of innovation at the early stage of education so as to build the innovation awareness during the entire education process and to upgrade it through lifetime.

The above main findings on the deficiencies of innovation policy in Slovenia do not mean that innovation is not taking place, which is evidenced by surveys of Statistical Office and other government and non-governmental institutions. The analysis on the introduction of ISO standards to SMEs reveals that while quality management was the top priority of Slovenian enterprises in past five years innovation is taking the lead in the future. Generally, the awareness in the business sphere of the necessity of innovation is growing. There are success stories concerning R&D policy measures (e.g. young researchers programme) or innovative enterprises (see Box 1 and 2) as well.

Reorientation of state aid to horizontal measures (e.g. R&D) is expected to further stimulate innovation It is believed that reorganisation of the government in the beginning of 2001 (technology department of former MST and Ministry for SMEs were joined to Ministry of Economy) will provide for better co-ordination of innovation policy mechanisms and their efficiency, particularly concerning the SMEs. Recently, several new mechanisms and instruments conducive to innovation were conceptualised and introduced by the Ministry of Economy (e.g. development centres at regional or branch level, clusters). Their implementation and efficiency remains to be seen.

There is a need for active policy on building social climate in Slovenia supportive to innovation and for broader understanding of innovation, which is still primarily limited to technical terms while neglecting organisational and attitudinal change. Accordingly, mechanisms to foster innovation should not be geared only to favourable R&D environment (including building bridges for more intensive cooperation between the research and business sphere), but also to education system adjustment, particularly University (innovation awareness building, interdisciplinarity, flexibility), to fostering of innovative management techniques introduction, to financial market/fiscal system improvement, and to more efficient and transparent administrative framework support.

Annex 1 – List of people interviewed

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Annex 2 - List of documents received and consulted

Analiza stanja inovacijske dejavnosti po slovenskih podjetjih v letu 1999 (The analysis of innovation activity in Slovenian firms in 1999), Komisija za intelektualno lastnino in inovacijsko dejavnost pri GZS, September 2000.

Annual report on state aid in Slovenia in 1998 and 1999, Ministry of Economic Relations and Development, June 2000.

Autumn Report 2000, Institute of Macroeconomic Analysis and Development, 2000.

Basle Andreja: Razvojni centri - šest suhih let (Development centres), Gospodarsku vestnik, No. 22, May 2001.

Bavec, Cene: On the role of the Ministry of S&T in technological development, Raziskovalec, 1998, vol 28, no.3, p. 64.

Benchmarking Slovenia: An Evaluation of Slovenia's Competitiveness Strengths and Weaknesses, Ministry of Economic Affairs, 2000

Bešter, Janez et al.: Evalvacija tehnoloških projektov, ki jih subvencionira MZT oziroma MG: Podjetniški in drugi učinki the projektov – ekonomika subvencioniranja z vidika države (Evaluation of technology projects co-financed by the MST or ME: Business and other effects of projects: the economics of subsidies from the state's viewpoint), IER, October 2000.

Božičnik Stane: Analiza razvoja inovacijske dejavnosti v Sloveniji na področju malih in srednjih podjetij s predlogom ukrepov, (The analysis of development of innovation activity of SMEs in Slovenia), SABEX d.o.o., Pospeševalni center za malo gospodarstvo, March 2001.

Bučar, Maja: Economic Restructuring with Equity and Competitiveness: Implications for S&T Policy in Slovenia, EADI/RPI Workshop: Economic Restructuring with Equity and Competitiveness: Implications for S&T Policies in Transition Economies, Lund, 6-8th June, 1996, 20 p.

Coopers & Lybrand: Country reports RTD infrastructures: Extended management summaries, Luxembourg, Oct.1997, 10 countries

Draft Strategy for SMEs and Entrepreneurship Development in Slovenia in the Period 2001-2005, Ministry of Small Business and Tourism, October 2000.

The Economist Intelligence Unit Report on Slovenia, May 2000.

EC Regular report, Slovenia 2000, Progress towards Accession, European Commission, November 2000.

European Trend Chart on Innovation, EU Directorate General Enterprises "Innovation and SMEs" Programme, October 2000, 26 p.

Gliha Marko: Empirična ocena o stanju tehnološkega razvoja v predelovalnih dejavnostih, Raziskovalni projekt Tehnološki razvoj kot razvojni dejavnik v okviru Strategije gospodarskega razvoja Slovenije, Inštitut za ekonomska raziskovanja, maj 2000.

Innovation Activity in Manufacturing, Slovenia, 1998, Rapid Reports, Statistical Office of the Republic of Slovenia (SORS), No.81, 200o.

Investing in Slovenia, 2001, Centre for International Cooperation and Development.

Kobal Edvard, Štiblar Martinčič Draga (eds): Pospeševanje tehnološkega razvoja Slovenije 1996, Zbornik predavanj in sklepov 1. Letne konference, Portorož, 10.-11. Junij, 1996. 161 p.

Komac, M. and Krawczynski J. (eds.): Conceptual Approaches to Support of Industrial Research and Development in Slovenia, Forschngszentrum Julich, GmbH, 1995, 121 p.

Kos, M.: Strateška tehnološka usmerjenost slovenske industrije, Ministry of Science and Technology, Ljubljana, 1996, 13 p.

Lesjak, I.: tehnološki part Ljubljana d.o.o.- kaj smo in kakšni so naši načrti (Technology park Ljubljana- who we are and what are our plans), Poslovne priložnosti, no 4-5/6, May,June 2001, pp12-14.

Likar Borut (ed.): Inovativnost za mlade, Phare Mocca, 2000, www2.arnes.si/~inovacije

Monitoring, updating and disseminating development in innovation and technology diffusion in the Member States, EIU, May 2000

Mulej, M.: Ekspertiza o vgrajevanju inovacij in inovativnega poslovanja v vizijo, strategijo in taktiko v Sloveniji, (Expert opinion on incorporation of innovation and innovative business practice in the vision, strategy and tactics in Slovenia), 2000

Nacionalni raziskovalni program (National Research Programme), februar 1995, Ministrstvo za znanost in tehnologijo.

National Observatory Country Report, Slovenia 1999; European Training Foundation, Ljubljana, 2000, 141 p.

Negotiating Positions of the Republic of Slovenia for Negotiations on Accession to the EU, Jan.2000, Rep. of Slovenia: the Government Office for European Affairs, 344 p.

OECD Economic Surveys, Slovenia 1997, OECD- Centre for Co-operation with the Economies in Transition, 1997, 154 p.

Pejovnik Stane, Komac Miloš (eds.): Transfer of Knowledge: Academia-Technology-Industry-Quality of Life. FORUM Bled, 3-6 December 1995. 197 p.

Poročilo o makroekonomskih gibanjih in uresničevanju ekonomske in strukturne politike (Report on macroeconomic trends and realisation of economic and structural policies), Institute for Macroeconomic Analysis and Development, March 2001.

Pivka Marjan, Uršič Duško: Vpliv ISO 9000 na konkurenčnost malih in srednje velikih podjetij, Ministrstvo za malo gospodarstvo in turizem, 1999.

Programme of Support to Business enterprises in development of new technologies and establishment and operation of their R&D units 2000-2003 (proposal); May 2000; 54 p.

Rapid Reports, Research and Development, Statistical Office of the Republic of Slovenia (SORS), No.13, 2001.

Rapid Reports, Statistical Office of the Republic of Slovenia (SORS), No.292, 1999.

Rojec Matija: Restructuring with Foreign Direct Investment: The Case of Slovenia. Institute for Macroeconomic Analysis and Development, 1998. 81p.

A Science and Technology Strategy for Slovenia, April 1994, GOPA Consultants (PHARE Operational Programme), 184 p.

Slovenia: Administrative Barriers to Investment, April 2000, Foreign Investment Advisory Service, IFC/WB, 88 p. + annexes

Slovenia. Economic Transformation and EU Accession, A World Bank Country Report, 1999, Volume I + Volume II,

Slovenia: 2000, Information technology Country Profile-Export Potential, International Trade Centre, UNCTAD/WTO, 2000.

Spring Report 2001, Institute of Macroeconomic Analysis and Development, 2001.

Stanič, U., Potočnik B., Špilek H. Projekt: Slovenska inovacijska agencija, SZF, 1998

Stanovnik, Peter: Tehnološki razvoj, v Strategiji gospodarskega razvoja Slovenije, UMAR, Ljubljana, 1995, pp. 183-200.

Stanovnik Peter: R&D Performance and Technological Development in a Transition Economy - A Case of Slovenia, EADI Workshop »Economic Restructuring, Equity and Competitiveness: Implications for S&T Policies in Transition Economies«, Lund, June 1996, 15 p.

Stanovnik, P. in Kovačič, A.: Measuring Competitiveness of national economies with emphasis on Slovenia, Working Paper No.6, IER, Ljubljana, Sept. 2000

Stare Metka, Bučar Maja: Diffusion of Innovations and Technology Transfer in the Present R&D System in Eastern Europe - The Case of Slovenia, ACE Project no. P95-2028-R, June 1997, 49 p.

Stare Metka, Bučar Maja: Diffusion of Innovations and Technology Transfer in the Present R&D Systems in Countries in Transition, v Pejovnik, Komac (ed.), Science and technology investment: priority in the development strategy of the nation, Ministry of Science and Technology of the Republic of Slovenia, 1999, pp. 78-88.

Statistical Office of the Republic of Slovenia, National Accounts, First Release No. 52, 11 May, 2001.

Tehnološko predvidevanje: Technology Foresight – Slotech 2010, material compiled by ME and MESS for the round table, April 2000

The Strategy of Development of SMEs and of Entrepreneurship in Slovenia in the Period 2001-2005, draft, Ministry of SMEs and Tourism, October 2000.

Trendchart report- Slovenia (Hedvika Špilek, IER) May 2000

Walter H. Gunter (ed.): Slovenian-German Co-operation in the Field of Technology Policy. Lectures on Technology Transfer, Innovation, Financing, Evaluation 1993-1997. Frauenhofer Institute for Systems and Innovation Research, 1997, 282 p.

The World Competitiveness Yearbook 2000, IMD, 2001.

http://www.ess.gov.si/English/html/

http://www.acs-saec.si/llw/

http://www.gzs.si/eng/borza/index.html

http://www.sipo.mzt.si/STATIST.html