

## ***Innovation Policy and Problems of Creation and Development of the National Innovation System in Ukraine***

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### **1. Introduction**

In first years of independence, the governments of Ukraine did not pay adequate attention to innovation development despite some important legislative acts being passed in the 1990s and early 2000s. A calamitous reduction of funding for scientific research occurred during the period of market transformation including a cutting down of funds for research equipment. Economic crisis led to a sharp reduction in orders for S&T results from the industrial sector. In addition, structural changes in the Ukrainian industry led to the domination of mining, energy and ferrous metallurgy sectors in the national economy. These sectors are not very active in innovation, as their technologies are relatively stable and products are not diverse. In the mid-1990s, Ukraine's official GDP decreased by more than 60% in comparison with the level in 1990. Whole hi tech industries disappeared (for example, electronics). The size of domestic demand for numerous products, and especially high-tech ones, fell dramatically.

It is also necessary to note that the negative structural changes stemmed from the low level of innovation activities amongst the majority of Ukrainian enterprises. The values for indicators concerning basic innovation activities (e.g. number of new technologies, the number of inventions, etc.) went down 5-15 times between the 1990s and 2000s. Yet the pattern of science and technology activities has changed gradually. Key efforts were not directed towards the development and introduction of domestic technologies and products but towards the adaptation of imported equivalents. This has resulted not only in the exaggerated technological dependence of the country, but also to a decline in the country's existing science and technology potential

The economy of the country has become increasingly oriented towards producing of relatively simple goods for export. Even the remaining working enterprises involved in the machine-building sector (for example, shipbuilding), as a rule, occupy low value added segments in technology intensive sectors. Competition in such market segments is particularly intense and Ukrainian companies are persistently under threat of losing out to businesses from developing countries.

Starting a few years ago, along with overall economic recovery, the situation has started to change in machine-building sector. Some Ukrainian enterprises are included in the production chains of large companies, although this inclusion is only 'skin deep'. For instance, Ukrainian firms can assemble brand-name cars but do not supply essential components for them. This reduces the room for innovation and technological progress in Ukrainian industry but, to some extent, it also opens opportunities for possible technological upgrading in the future.

## **2. Tracing the evolution in the governance system**

Despite a certain number of state agencies and advisory bodies, governance of the national innovation system in Ukraine remains fragmented and ineffective, as the roles, responsibilities and financial obligations of the different state bodies remain 'blurred'. The system itself is the subject of permanent change, especially at the highest executive level, where political instability is reflected in competition between the President and the Government to obtain control over processes concerning industrial development.

Prior to the current political reform, which started after the Presidential elections in late 2004, the President of Ukraine was a key figure. He could formulate policy in different spheres and the government had to implement this policy. The parliament was also strongly influenced by the presidential administration despite it preserving some independence from the executive power. However, even in this period, the distribution of functions between different ministries and agencies in the sphere of innovation governance was not clear. All co-ordination was made through the Cabinet of Ministries, in which the role of the Ministry of Finances was crucial. In fact, this Ministry can block all measures aimed at stimulating innovation (and it has done this on several occasions during the 2000s). Thus, every year it stops implementation of the tax incentives for technoparks and other innovative structures on the grounds that such measures will reduce budget revenues.

There have been a number of changes in the governance of the national innovation system in Ukraine in the years following independence. All national governments usually included declarations in their programs on the need to stimulate innovation for the well being of the national economy. The functions of different ministries and state committees have changed several times in 1991-2006. For instance, the Ministry for Education and Science has changed its name and function six times during this period. In the mid-1990s, a separate State committee for Science and Innovation existed. Later, following pressure from foreign advisors, it became part of the Ministry for Education and Science. At the same time, the First Deputy Minister responsible for science and innovations has some autonomy in decision-making within the framework of the Ministry.

The key recent event has been the creation of the State Agency for Investment and Innovations (SAII) in December 30<sup>th</sup>, 2005, following the Presidential Decree N. 1873/2005. In turn, this Decree resulted in the Decision of the Cabinet of Ministries of Ukraine N. 1335/2006. According to the Decree, the responsibility of the SAII covers more than twenty different tasks including

preparation of high level decisions concerning innovation, attracting new investments especially for innovation projects, development of S&T programs, and control over innovation projects.

Several state companies, including the National Innovation Company (NIC) and the National Agency for Attracting Foreign Investments, were transferred to the SAI. Thus this Agency has received not only formal right to govern and coordinate innovation and investment policies but also financial resources to implement these functions. NIC was created in December 1999 to substitute the State Innovation Fund founded in 1992. The Fund receives a small share of the profit from industrial enterprises. In mid-1990s, the Fund accumulated several hundred million USD for financing innovation projects, but the government used the money to cover a budget deficit. In 1994, the Fund created regional bureaux and started to provide money to innovation projects throughout Ukraine. More than 400 million USD were distributed as long-term, low-interest loans, although the results of the projects were inadequate. The Fund was unable to receive the bulk of its loans back and no serious innovations were made. The aim of NIC is to improve the situation but NIC can only use money from the returned debts of the Fund to finance innovation activities. All centralised subsidies have been stopped (a fixed percentage of the profit tax of all profitable enterprises of the country). Financing of innovation activities through this specialised state agency has declined twenty fold. More recently, NIC (since 2003) and SAI (in 2006) have received some budget money for financing innovation. However, their financial resources remain limited.

In 2000-2006 NIC had provided financial support for 35 innovation and investment projects for 146.5 million Hryvnas (about 7 million Euros). Only seven of them, worth 21 million Hryvnas (about 3 million Euros) received 100% of financing from the state budget. At the same time, NIC had 696 agreements, inherited from the State Innovation Fund. Total amount of 'bad debts', received from the Fund reached more than 409 million Hryvnas<sup>1</sup> (almost 60 million Euros).

Innovation programs of the Ministries are numerous and ambitious but their results are very limited thanks to poor financing and inadequate mechanisms of support of innovation projects. The size of innovation and R&D budget varies for every ministry year by year but usually it does not exceed even 100 -150 million Hryvnas (up to 20-25 million Euros) for the biggest Ministries. The bulk of the budget money for R&D (between two thirds and three quarters) is going to the system of Academies of Sciences. 'Innovation money' is distributed more evenly but the main source of innovations are finances of the enterprises, not the state budget. Probably, the best example of innovation policy is related to two technoparks, based on Institutes from the National Academy of Sciences. The idea of technoparks has been very popular since the beginning of 1990s. It is important to mention that according to the legislative documents on technoparks, only innovative projects with the overheads they transfer to the technopark management

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<sup>1</sup> <http://www.udik.com.ua/ukr/activity/reports/?id=92>

were exempted from standard taxation procedure. Not companies themselves can receive different types of state aid. After several years of relatively successful development, all privileges to technoparks were abolished in early 2005. In May 2007, a new law on technoparks passed its first hearings (Law N1064-V on May 22, 2007). However, thanks to political fighting and possible early elections, it is not clear when the second and the third hearings will take place. The new law determines IPR, the rights and duties of the park's management, definitions of the basic elements of technoparks, and so on. It is also establishes zero- level custom duties on the import of new equipment and raw materials that are not produced in Ukraine.

### **3. Innovation projects**

Essential to the understanding of innovation policy in Ukraine is the selection of innovation projects. The state does not support innovation activities of commercial companies or R&D organizations or commercial companies but the innovation projects that they undertake. It is assumed that all such projects are selected on competitive basis. This situation is in striking contrast with the support of R&D, where the state provides the bulk of financing to organizations in 'block grants', not on the competitive basis.

Innovation projects are selected on the basis of the Law of Expertise and Law on Innovation Priorities.

The criteria considered when selecting innovation projects include:

- project has to be relevant to the national priorities in S&T and innovation sphere (these priorities are changed every five years by Parliament);
- project has to aimed at the practical implementation of new, high-tech or energy-saving technologies or competitive products;
- financial indicators of the project have to be justified, and documentation has to meet technical, ecological and social standards;
- technical characteristics of the new product have to meet high standards;
- legal problems, related to the project, have to be resolved in advance;
- financial and legal status of the enterprise undertaking the project has to be appropriate to meet the eligibility criteria of the project.

A special Inter-ministerial Commission is responsible for project selection, if the project is really large and it comprises different organizations from different ministries. It includes representatives of different ministries and state agencies. The Commission has different sections, which are responsible for different sectors of the economy (engineering industry, agriculture and so on). If the project is undertaken within one ministry or agency, the commission from this ministry or agency considers the project.

The competition is open. It starts following an announcement on the Internet and in the media (in specialized journals). The announcement and conditions of the competition are declared well in advance of the deadline. Usually, Ministries are responsible for the programs, related to the profile of their activities. For instance, the Ministry of Transport is responsible for upgrading the

railway system. The program of upgrading could include several projects, aimed at creation new types of rails, trains and so on. Ministry of Transport has to coordinate it with some other ministries ( Ministry of Economy, Ministry of Industrial Policy and, probably, some others – it depends on the Cabinet of Ministries).Ministry of Transport could announce the call for projects but the directions of R&D and innovation activities have to be agreed with above mentioned ministries. In the case of really large and important program of development, which includes innovation ‘components’ , inter-ministerial commission could be created to select relevant projects.

Formally, competition for financing of innovation projects is free and open. However, in reality, Ministries often know winners before the start of the competition whilst other participants are ‘fake players’. As a rule, the winner belongs to the branch ministry, which is in charge of the competition. Formally, at least two independent experts are involved in the evaluation process. However, the selection of evaluation experts is not a strict procedure. Very often evaluation experts are also members of the teams, which participate in the same competition that they are evaluating.

The evaluation of project implementation is usually made by the commission formed by the corresponding Ministry at least once per year, and at the end of the project. If the project has identified ‘key performance indicators’, then the project results are compared to these indicators. However, very often the objectives of innovation project are not defined in sufficient detail. In addition, as a rule, very few projects have sufficient budget to reach their proclaimed objectives. This is frequently cited as the reason why project results are inadequate.

If a new draft of the law, which is related to innovation has to be discussed ( draft of the Law on technology transfer, for example), the ministry responsible for preparing the draft can convene a special meeting and ask to prepare propositions to such a draft from other ministries and agencies.

As a rule, foreign experts do not take part in the evaluation processes. The only known exception is the National Program of S&T Forecasting (2004-2006), but the participation of foreigners was not very active as the state could not provide sufficient financing.

According to the law on Priority Directions of Innovation Activities in Ukraine (N. 433-IV, on January 16, 2003), all ministries have to supply reports to the Cabinet of Ministries on innovation activities related to the established priorities. Reports have to include data on the following indicators: the volume of innovation investment, level of profitability of innovation investment, the share of R&D expenses in GDP, the share of innovation production in the total volume of production, number of inventions per 1 million of population, and the share of implemented inventions in the total number of inventions during the year. However, no benchmarking-type indicators were established by the government. This set of indicators is not completely relevant to the objectives of the state innovation policy but it is included into the Law.

#### 4. Support of innovations in regions

For years regional authorities had no resources for any special innovation support activities, although some regions had special chapters devoted to the innovation activities. Some administrations, such as those in the Kiev and Donetsk regions, have special departments responsible for the support of S&T and innovation activities. However Only Kiev, Lviv, Nikolaev and Tchernivtsi oblasts have provided some money for innovation activities from their budgets. The contribution of regions to the total volume of financing of innovation reached 1.4% in 2005. The main source of innovation funding came from enterprises' own funds (77.3%) and loans (17.8%).

Thus, declarations on support of innovation development and the real support of innovations differ substantially in different regions. At the same time, it is evident that almost all regions are trying to develop elements of local S&T and innovation infrastructures (e.g. research institutes, technoparks, universities and hi-tech companies). These steps had had positive impact on the general level of innovation activities in the country, which resulted in the growth of innovation production in some regions of the country.

Since 1992, in accordance with the corresponding law, several special free economic zones have been established. Between 1998-1999 another type of innovative infrastructure emerged – so-called Territories of Priority Development (TPD). Up till the end of 1999, 11 free economic zones (FEZ) and 72 TPD were created. In many cases, creation of these structures was a result of lobbying from the side of local authorities as opposed to reasons of economic rationality. Some zones are used for laundering money and avoiding tax payments<sup>2</sup>. The main zones of priority economic development were created in Transcarpathia oblast, Northern Ukrainian (Chernobyl-affected) territories, Eastern and Northern Crimea and Donbass regions. In total, the territories of priority development and special economic zones represented about 10% of Ukraine's geographical territory in 2005. At the same time, hopes that there would be a quick growth in foreign investment and technology transfer did not materialise. The level of FDI was lower in the majority of zones, and only in four zones (mainly in Western Ukraine) was it higher than national average but the total volume of investment in these regions is not high. At the beginning of 2005 in Truskavets resort zone, it was 429 USD per capita against 178 USD per capita in Ukraine as whole.

The national innovation company (SAII) has supported innovation projects through its local branches but the total number of projects is not high. There were only six such projects in different regions (oblasts) in 2005 with a total budget of 926 thousand Hryvnias (130 thousand Euros).

Industrial clusters have been formed in some regions. The first one was created in 1998 in Khmelnytsk region on the basis of textile and clothes factories.

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<sup>2</sup> Ukraine. Economic Assessment. – OECD-Paris, 2007.

The cluster Podillya Pershyi, which has been created with the help of USAID, helped its 24 enterprises, Technical University, two colleges and several service companies to receive and disseminate information on innovations and establish contacts with potential customers from other regions of Ukraine and from abroad<sup>3</sup>. This is an example of organizational innovation. Unfortunately, there is not enough information about the practical activities of this cluster in recent years to make a conclusion about the success or failure of the project.

As a response to the challenges of innovation development on the regional level, the National Institute for Strategic Studies along with specialists from the National Academy of Sciences of Ukraine proposed to create a Strategy for Regional Innovation Development<sup>4</sup>. However, political instability has led to the postponement of this initiative.

## **5. Recent Trends in National Innovation Performance**

The development of research activities is a potential driving force for innovation in Ukraine. As it was mentioned above, in 1990s key parameters of R&D and innovation spheres shrunk by 2-5 times. In spite of the substantial increase in resources allocated to R&D during the last six years, the amount of finances and the manpower remains considerably lower than the EU average (both in absolute and relative terms).

Innovation financing, especially in the very early stages of company development, is virtually non-existent in Ukraine. There are several registered technoparks supporting mainly spin off (intramural) firms from basic research institutes, but their financial support is hard to classify as venture capital investment. A business-angel support tradition does not exist at all. In spite of this, the share of university R&D financed by business is comparatively high. Nominally universities have increased their spending on R&D by 42.9% between 2001 and 2005 (in constant prices) but their share in GERD since Soviet times remained very poor – nearly 5% (the same is the share of BERD aimed to high education sector), so it is hard to consider this latter sector as a potential driving force for national innovation performance. However, it is worth pointing out the growth of business share in HERD financing due to cooperative projects (from 24.3% in 2001 to 32.1% in 2005, which exceeded the EU's highest level in Latvia – 23.9% and the EU-25 middle level by four times) although the state budget share is still higher (56.4% of total in 2000 and 55.6% in 2005). General information on innovation activities in the country is presented in pictures 1-3.

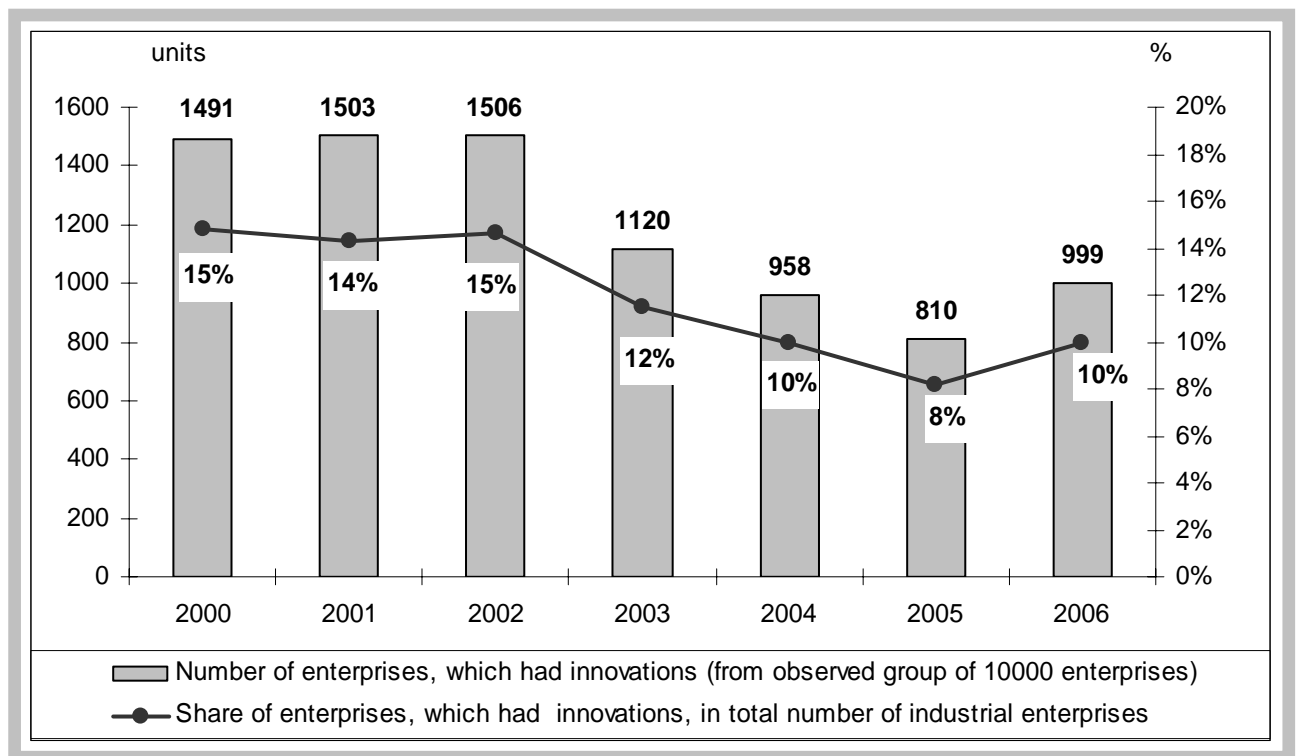
### **Picture 1**

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<sup>3</sup> Malyi N. Clusters as a New Form of Entrepreneurial Amalgamation. – Paper to the Regional UN Forum “Social Aspects and Financing of Industrial Restructuring”. – Moscow, November 23-27, 2003, 12 pages.

<sup>4</sup> Makogon Yu. Novaya regionalnaya politika v Ukraine: problemy i perspektivi. – Materials to the Parliamentary Hearings, May 18, 2005, - Verkhovna Rada of Ukraine, 2005, p. 77-105 (New Regional Policy in Ukraine: Problems and Perspectives – in Russian).

**Number of enterprises, which had innovations, and their share in total number of industrial enterprises, 2000-2006**

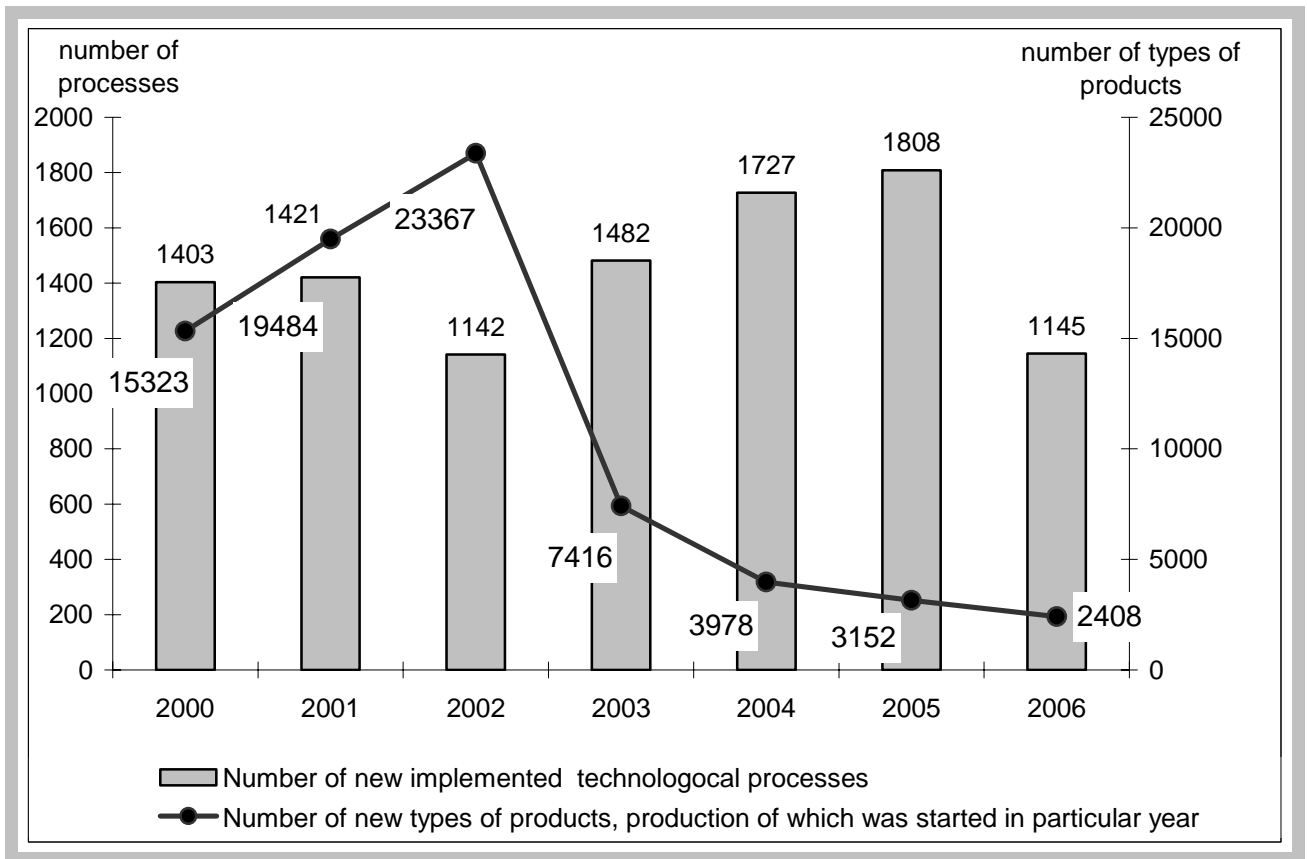


Source: Scientific and innovation activity in Ukraine: statistical report / State Committee of Statistic of Ukraine. - Kiev, 2007. — P. 224.

As this picture shows, total number had tendency to decline, which shifted slightly in 2006. The time will show, how this tendency is robust.

**Picture 2**  
**Innovation products and processes in the Ukrainian industry in 2000-2006**





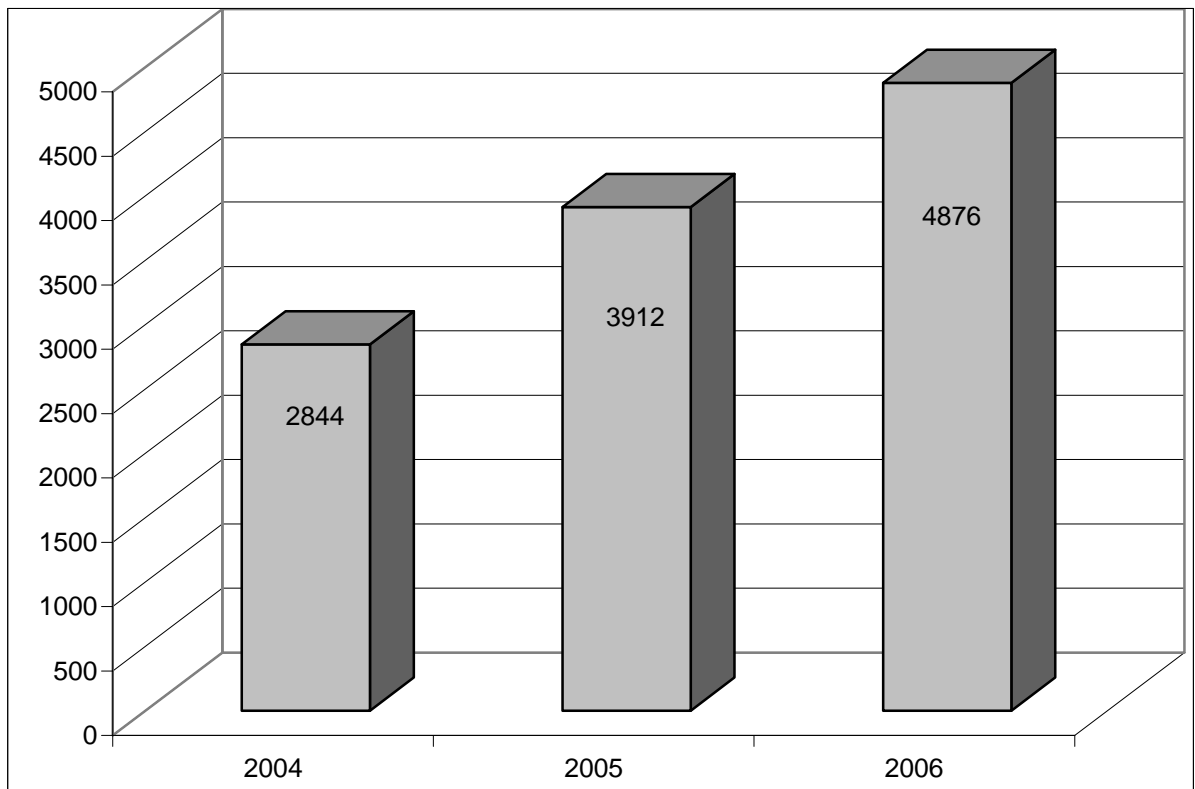
Source: Scientific and innovation activity in Ukraine: statistical report / State Committee of Statistic of Ukraine. - Kiev, 2007. — P. 236.

At the same time, the number of innovation process has tendency to grow, while the number of products is going down. This phenomena could be explained by the growing competition from the side of foreign companies and by the concentration of innovation activities in a smaller number of enterprises, which became the leaders of the industry. .

One significant aspect in the context of innovation performance is the relatively low level of transformation of applied knowledge into innovation activity. The share of applied research in total expenses on Ukrainian R&D has been lower than the share of expenses on fundamental science since 2001. On the other hand, only 16.6% of all GERD in 2005 found implementation in innovation sphere (in 2001 it was only 7.1%). While innovative expenditures have been on the rise during 2001-2005 (an increase of 84.1% in constant prices), their level remains insufficient and, sometimes, even underestimated in many sectors<sup>5</sup>. The share of innovative oriented enterprises decreased to less than 10% in 2006. This is why the share of enterprises receiving public funding (from the central and local authorities' budgets) for innovations was extremely low. It was at the level of 2.1% of total innovative oriented firms in 2000 and grew to 3.7% in 2005.

**Picture 3**  
**Volume of innovation production in industry, 2004-2006 (mln. Euros)**

<sup>5</sup> Only innovations in industry, not in the service sector are taken into account by the regular Ukrainian statistics



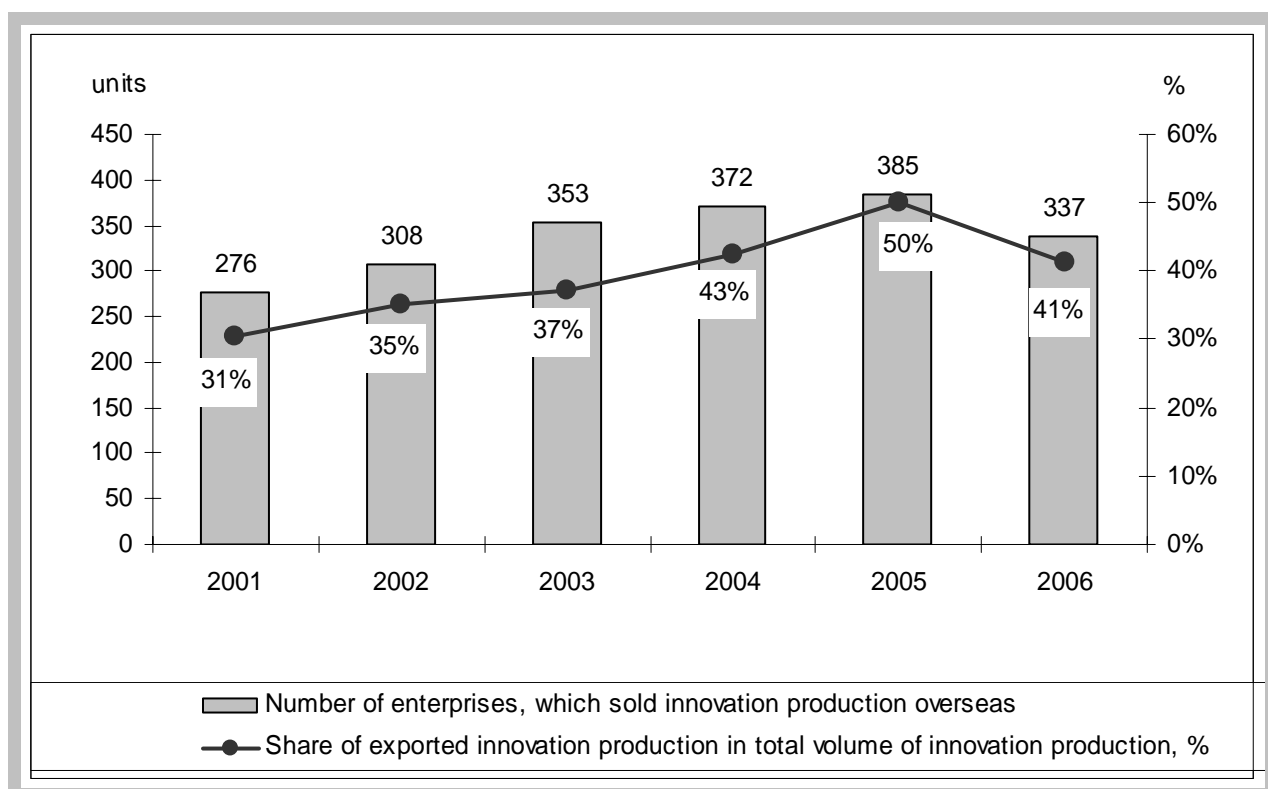
Source: calculated on the basis of data of the Ukrainian State Committee of Statistics.

The share of Ukrainian medium and high-tech R&D in total manufacturing R&D expenditures (87.7% in 2005) is similar to the EU-15 average and even exceeds the Japanese level (86.6%). The problem is that the total volume of innovation expenses is relatively small, and very often these expenses are not directed to commercially promising novelties or new effective processes. These sectors are also not competitive in the international markets. Ukraine depends heavily on foreign trade, but the share of high-tech exports in its total exports (1.08% in 2005 and 1.62% in 2000) is the lowest by comparison with all of the EU-25.

Export of innovation production is also concentrated in a relatively small number of enterprises (see picture 4)

**Picture 4**

**Number of enterprises, which exported innovation production, and the share of this production in total volume of innovation production, 2001-2006**



Source: Scientific and innovation activity in Ukraine: statistical report / State Committee of Statistic of Ukraine. - Kiev, 2007. — P. 266.

The structure of production in the manufacturing sector and the share of high-tech products in Ukrainian exports show that there is an increasing need to encourage innovation in resource based sectors, mainly due to the considerable economic size and remaining export capacities of these sectors.

The situation with regard to innovation in the SME sector is disturbing. Only 6% of small industrial enterprises were innovative in 2006, among medium-sized enterprises the share was 16%, while among large enterprises it was 40%. The problem is that the share of innovation SMEs declines in recent years<sup>6</sup>.

Unfortunately, the State Committee of Statistics of Ukraine only collects data on a very limited number of indicators in the innovation sphere and so it is difficult to make a comprehensive analysis of the situation. The Community Innovation Survey methodology for collecting data on innovation activities is introduced in Ukraine but for several oblasts only in an experimental format. Paradox is that Ukraine collects several of innovation survey indicators but based on its own methodology. Work on comparability of these indicators and their

<sup>6</sup> Naukova ta Innovatsiina dialnist v Ukraini. – Kiev: State Committee of Statistics of Ukraine, Various editions 2002-2007. ( Scientific and Innovation Activity in Ukraine – in Ukrainian)

harmonization with the corresponding EU indicators is the key task for the State Committee of Statistics of Ukraine in the near future.

In parallel, problems concerning innovation development have been formulated more specifically during the annual survey of innovation activities within industrial enterprises conducted by the State Committee of Statistics of Ukraine (see Table 1)<sup>7</sup>.

Table 1:

Factors that prevented innovation activities amongst Ukrainian industrial enterprises in 2006

Factor that prevents innovation activities	The share of enterprises which mentioned the factor from the total number of surveyed enterprises, %
1. Inadequate own financial resources	80.1
2. High required investment in innovation	55.5
3. Inadequate financial support from the side of the state	53.7
4. High level of economic risk	41.0
5. Poor legal base for innovation activities	40.4
6. Long period for return on investment	38.7
7. Lack of financial resources of potential consumers to buy innovative products	33.3
8. Lack of qualified personnel	20.0
9. Difficulties in establishing co-operation with research institutes and other enterprises	19.7
10. Inadequate information about consumer markets	17.4
11. Inadequate information about innovative products	17.3
12. Low demand for innovative products in the market	16
13. Unwillingness of the enterprise to innovate	15.5

Based on the results in the above table, the most important barrier to innovation activities for Ukrainian enterprises is the lack of financial resources. Enterprises virtually never use bank loans to finance innovation activities as the interest rate in Ukraine is prohibitively high. It varied between 14 and 21% in 2006 depending on the currency of the loan (USD, Euro or the national currency Hryvna).

In fact, Ukrainian state innovation policy has not changed substantially in recent years. Up to now, the main focus of government policy mix is on direct support of innovation in the form of (partial) financing of S&T programs and provision of direct financing to selected innovation projects. Till the 2005,

<sup>7</sup> Nauka I Innovatsii v Ukraini. Statistichny zbirnyk.- the State Committee of Statistics of Ukraine, Kyiv, 2007 ( Science and Innovation in Ukraine – in Ukrainian).

techoparks had some tax incentives for stimulating innovation activities but the abolishment of these incentives in early 2005 has led to stagnation of technopark's development. Administrative regulations, aimed at support of innovation are brought into operation due to juridical problems. The gap between the higher education sector and the industry is substantial. Current legislation does not allow universities or research institutes to be founders of a spin-off company with non-state ownership. The introduction of the Law on KPI technopark could, probably, change the situation but it is too early to make conclusions about the effectiveness of changes.

Indirect measures of innovation support (tax and customs benefits or exemptions) are practically nonexistent. As a rule, companies are not allowed to deduct their R&D expenditures from their company tax declarations.

## 6. Technoparks and other forms of innovation support

It is important to stress that in the mid-1990s – mid 2000s numerous mechanisms of business support were created with the state participation (see Table 2).

Table 2. Elements of business infrastructure in Ukraine, 1998-2006

Type of infrastructure	1998	2000	2002	2004	2006
Business- incubators	28	46	63	73	70
Business – centres	57	132	257	300	404
Regional funds for business support	48	72	107	149	104
Technoparks	-	3	7	16	16

Source: Matushenko I.U. Perspectives of creation of the National innovation system in Ukraine (In Ukrainian). Available at:

[http://iee.org.ua/files/alushta/13-matyushenko-perspektyvy\\_stv.pdf](http://iee.org.ua/files/alushta/13-matyushenko-perspektyvy_stv.pdf)

The problem is that almost all types of business support organizations, with the exception of technoparks, were not oriented towards supporting innovation development.

Elements of innovation support are distributed unevenly in the country. For example, there are 16 technoparks, established by the Law on Technoparks, and 13 technoparks of another category. All of them are concentrated in 10 regions, whilst 26 regions have no technoparks at all. Some regions (Zhitomir, Odesa, Cherkasy) do not even have business-incubators, whilst there are leasing centres in Kharkiv, Zaporizhzhia and Transcarpathia regions.

Initially, in the mid-1990s, technoparks were considered as free economic zones (according to the Law on Basic Foundations of Creation and Functioning of Special Economic Zones, 1992). Now 11 such zones exist in Ukraine. However, all of them have non-technological orientation. Enterprises in these zones are largely involved in the resource based production of goods and services. In many

cases these zones were created to reduce socio-economic problems of former coal-mining or ferrous metallurgy areas.

The first technopark was created in 1994 in Brody, Western Ukraine, near the Polish border in the territory of a former missile base. Unfortunately, this first attempt was not successful. The money, which was provided by the EU, was stolen or misused, and Brody technopark itself was converted into large warehouse by the group of local entrepreneurs and their Polish partners in the mid-1990s.

In July 1999, another Law on Special Regime of Investment and Innovation Activities for Technological Parks was passed through Parliament. According to this Law, three new technoparks with some real financial privileges for innovation companies were created – Technopark in the Paton Institute for Welding (Kiev), Technopark in the Institute of Semiconductors (Kiev), and Technopark in the Institute of Momo-crystals (Kharkov). The key features of these technoparks are as follows:

- 1) they all were created on the basis of leading institutes of the National Academy of Sciences of Ukraine with strong technological orientations
- 2) tax and customs privileges could be received not by the institutes themselves but by the specific (specially registered) innovation projects

Tax incentives included the possibility to import all materials and equipment needed for the innovation project without paying custom duties; the possibility to obtain tax credits; reduced taxes and access to cheaper credit (with state guarantees). Bearing in mind the high bank interest rates in Ukraine, the last step was especially important for the new technoparks.

Later 13 more technoparks were created in Ukraine, most of them between 2003-2004. The complete list of existing technoparks is given below:

1. Paton Welding Institute
2. Mono-Crystal Institute
3. 'Uglemash' (Coal-Machine)
4. Semiconductor technologies and materials
5. Institute of Technical Thermo-physics
6. 'Ukrintech'
7. Kiyiv Politechnika (National Technical University KPI)
8. Intellectual Information Technologies
9. Agrotechnopark
10. Scientific and Learning Equipment
11. Resources of Donbass
12. Textile
13. Ukrainian Microbiological Centre of Synthesis and New technologies
14. ECO-Ukraine
15. 'Yavoriv'
16. Engineering Technologies

It is important to note that some technoparks have not been created on the basis of institutions or organisations with real S&T and innovation potential of the organizations but as the result of forced decisions, lobbied by the influential politicians and businessmen. For example, Technopark 'Yavoriv' in Western

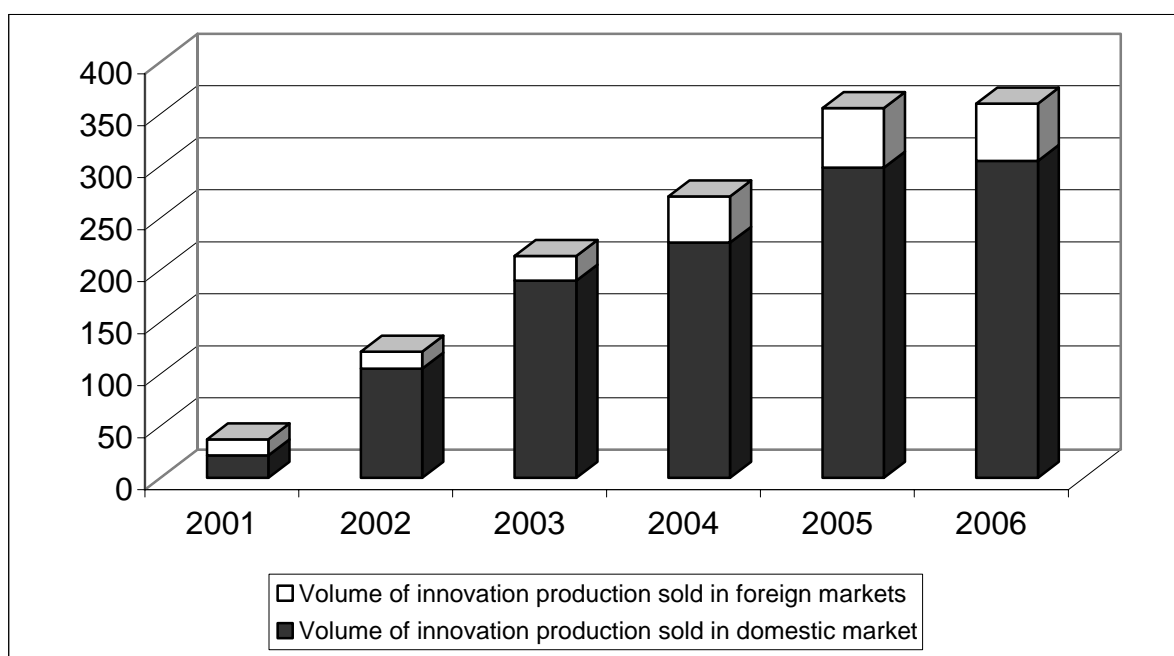
Ukraine has no research organization or innovation company in its structure. It is used as hub for export-import operations.

At the beginning of 2005, almost all the privileges afforded to technoparks were abolished. As a result, only 8 technoparks from 16 have re-started business activities. Others simply had no time and reason to commence operations following the ban on their special treatment. Some of them have not finished the stage of formation. Thus, the declaration about their creation has not been supported by the real work.

Additionally, it is important to stress that only two technoparks can be considered as successful examples – Paton Welding Institute and Mono-Crystal Institute. They represented 98% of all innovation products being produced in technoparks between 2000-2006.

**Picture 6**

**Dynamics of innovation production of Ukrainian technoparks, 2000-2006 (million Euros)**



Source: Technological Parks in Ukraine, 2000-2006: Economic and Statistical Survey. – Kyiv, NANU, 2007, 25 p. (in Ukrainian).

Despite their privileges, technoparks contributed over half billion Hryvnas (70 million euros) of different taxes to the central and local budgets between 2000-2005. They also created more than 3000 new jobs.

The technopark based at the Paton Welding Institute had 13 projects in 2006, while the technopark based at the Monocrystal Institute had 25 projects. It is worth mentioning that no new innovation projects were registered in technoparks between 2005-2006. This had led to a stagnation in innovation products in 2006. In fact, it was at the same level as in the previous year. On the other hand, the share of

technoparks in the total volume of innovation production in Ukraine declined from 10% in 2003 to 7.4% in 2006<sup>8</sup>.

Almost all projects at the Paton Welding Institute technopark are related to welding technologies and equipment but some of them are aimed at agricultural machinery and new energy saving technologies. The most famous project of the technopark is aimed at creation of a new technology for connecting different parts of human skin after medical operations. This project has been rather successful but political rows on privileges for technoparks has stopped all further developments.

Projects at the Monocrystal Institute technopark are aimed largely on obtaining new materials and purification of different substances, which can be used in medical and food industries.

As for other technoparks, they have started some projects but the bulk of them have been frozen due to political and economic uncertainty over the future of technoparks. At the beginning of June 2007, the first hearings of the new law on technoparks passed through the Ukrainian Parliament but it is unclear when it will pass into state law as Ukraine is involved into the conflict between major political parties.

## **7. Conclusion**

At the end of this short paper it would be possible to summarise positive and negative moments in the national innovation policy in recent years.

The positive changes in Ukrainian innovation policy formulation and implementation are as follows:

- Preparation of various laws in innovation sphere, which cover different aspects of innovation activities;
- Declaration of innovation development as a key priority at the national level and attempts are being made to implement different innovation – related programs
- Creation of the national patent system and its development in accordance with the international standards
- Creation of specialized state agencies, responsible for R&D and innovation
- Attempts are being made to stimulate development of different instruments of innovation support (technoparks, business incubators, direct financing and favourable tax regime for R&D organizations)

The negative aspects of the process of forming innovation policy are the following ones:

- Ukrainian legal system is not harmonized, as some lobbying groups with the help of the Law on Budget could stop implementation of the most important clauses of the laws, which are aimed at support of innovations.

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<sup>8</sup> Technologichni parki Ukraini v 2000-2006 (ekonomiko-statistichi ogyad). – Kyiv, NANU, 2007, 25 pages (Technological Parks in Ukraine: Economic and Statistical Survey – in Ukrainian).



- Innovation-related programs are numerous, and in the past it was difficult to find money for their realization. It is much better to have less programs that will receive better financing
- Ukraine has very few American or EU patents, if compare with other countries of the region, even with countries of smaller size. Partially, it could be explained by relatively high costs of patenting in these countries but the state has no special program of support patenting abroad, despite discussion about such program is still continuing in Ukraine.
- Specialised state agencies that have to support innovation, have overlapping functions, which are not clearly defined.
- Support of specialized instruments and elements of innovation infrastructure are not very effective, as the demand for innovation is low and the rules of functioning of the technoparks are revised substantially (and mostly negatively) within relatively short period of time.

In February 2007, the Ukrainian government adopted a new tax reform ‘concept’, which takes into consideration the need to stimulate innovation activities<sup>9</sup>. It contains the declaration that the government has an intention to make the tax system more effective as an instrument for promoting investment, innovation and energy-saving. The concept specifies major goals for the period 2007-2015. For the current year, it identifies the first priority task as being the optimisation of tax mechanisms for stimulating the development of special economic zones, priority development areas and technoparks. However, it is unclear how these plans will be implemented, bearing in mind the current political crisis and possible changes within the government.

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<sup>9</sup> Kontseptsia reformuvannia podatkovoi systemi Ukraini. – Cabinet of Ministries Decision No 56-r, Uriadovy Kurier, February 19, 2007 (in Ukrainian)