THE INTAS FP6 NIS INFORMATION NETWORK (ININ)

Concept Paper for Establishing National Information Points in Ukraine, Belarus, Moldova

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Archimedes Foundation

Tartu 2005

Pihl, T., Habicht, M., Toomla, S. Concept Paper for Establishing National Information Points in Ukraine, Belarus, Moldova. Archimedes Foundation. Tartu 2005.

The paper is a part of the project "INTAS FP6 NIS Information Network (ININ): Continuing Advice", financed by the INTAS Programme.

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Authors of the paper are especially grateful to Ms Anna Pobol from Institute for Economic Research at the Ministry of Economy of Belarus, Ms Olga Meerovskaya from NIP Belarus, Dr. Irina L. Fedorova from the Committee on Science at the Council of Ministers of the Republic of Belarus, Ms Olena Koval from National Information Centre for Ukraine-EU S&T Cooperation, Dr Mihail Selevestru Iovu and Dr Maria Selevestru Iovu from Center of Optoelectonics, NIP FP6 in Moldova, who provided valuable input into the paper.

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1. Introduction

'Winds of change' in the beginning of 1990ies transformed not only the socio-political system of former Soviet republics, it also paralysed to a large extent the performance of their science and research system. Formerly centrally administered structures found existing links suddenly cut off from Moscow jurisdiction and were forced to restructure the whole system keeping in mind local science and technology (S&T) conditions. These developments have had tremendous effect on the functionality of S&T systems in Newly Independent States (NIS), eroding many of previously existing strengths due to severe cutbacks in funding, depreciating infrastructure, brain drain etc, yet creating also a number of new opportunities in the face of proprietary business establishments, new markets in the USA, Western Europe and Asia, strong scientific potential in rapidly evolving technology fields.

With current paper, we aim to assess the effects of the restructuring, the current state of affairs in S&T systems of selected NIS – Ukraine, Belarus and Moldova – and put these developments into the context of S&T driven cooperation with European organisations in the framework of EU innovation programmes. Particularly, attention is paid to the proper and effective organisation of services provided by local EU innovation programmes liaison offices, so-called National Information Points (NIP) in each selected country. Obviously, the success of NIP is to a large extent pending on relevant support structures of the national innovation system, which should be taken into account while settling up the NIP.

However, the value of this paper will be fully realised only if there is mutual commitment present from all relevant stakeholders – NIP coordinators, EU advisors and state administration. Indispensable part of the paper is considered to be the section with recommendations to NIP to be applied in the process of organisation of their work as NIP, which is certainly non-exhaustive in its nature, yet important to be kept in mind.

2. International cooperation between EU and the third countries

2.1. Strategic cooperation between EU and NIS

After the fall of the Soviet Union in 1991, the EU Council of Ministers decided that technical assistance should be key in supporting the transformation of the NIS to democratic societies with competitive market economies, and created TACIS (Technical Assistance for the Commonwealth of Independent States).

Being committed to continuing its programmes for co-operation and assistance to the NIS, the EU has signed, and in most cases already ratified Partnership and Co-operation Agreements (PCAs) with almost all NIS countries, which provide an overall framework for relations between them, including the assistance programme.

Each PCA is a joint commitment for closer co-operation which aims to consolidate its democracy and complete the transition to a market economy. It establishes a political dialogue between the EU and the NIS country concerned, and sets the parameters for trade and harmonised economic relations, financial, social, scientific, technological and cultural co-operation. Detailed guidance

on priorities and implementation of the assistance programme comes from PCA Co-operation Councils and Committees[1].

The EU has general programmes and initiatives for RTD support with the NIS. These were decided when considered really necessary during the 1990s to meet urgent needs in those countries, ranging from critical environmental, energy or social problems to the essential reorienting of military scientists to civilian applications. All have evolved and contribute to consolidating or transforming the NIS' RTD infrastructure.

The fields covered by this wide-ranging EU support include science, technology, innovation and other policies. The programmes are managed by Directorates-General (DGs) of the European Commission, as well as by INTAS (www.intas.be), private non-profit office for implementing the policy of European Commission. The level of EU support granted to RTD co-operation is however limited by the competition rules.

The TACIS programme[2], administered by the External Relations DG together with the Joint External Services, also supports some S&T projects. The main areas of RTD covered are expertise in the development of science and technology in a market economy, and S&T innovation.

Finally, there are several 'other EU policies' with a research aspect in which there may be co-operation with the NIS. These include programmes such as nuclear safety (External Relations DG and Environment DG), space (Joint Research Centre), the environment (Environment DG), energy and transport, (Energy and Transport DG), industry (Enterprise DG), information society and telecommunications (Information Society DG), and higher education (Education and Culture DG)[3].

2.2. Participation of NIS in EU Sixth Framework Programme

The Sixth Framework Programme of the European Community is multi-annual programme for pan-European research, technological development and demonstration activities, with an overall budget of 17,5 billion Euros. The implementation of programme is based on vertical (thematic) and horizontal calls for proposals, which establish competitive nature of the programme in supporting the materialization of the best excellence in EU research and development. On the other hand, FP6 is designed to contribute to the creation of the European Research Area to maintain EU's competitiveness in strategic R&D on global scales.

Participation of third countries in EU Sixth Framework Programme (FP6) is endorsed by Regulation (EC) No 2321/2002 of the European Parliament and of the Council of 16 December 2002 concerning the rules for the participation of undertakings, research centres and universities in, and for the dissemination of research results for, the implementation of the European Community Sixth Framework Programme (2002-2006)[4].

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[1] http://europa.eu.int/comm/research/nis/en/eu-nis.html
[2] http://europa.eu.int/comm/external_relations/ceeca/tacis/
[3] http://europa.eu.int/comm/research/nis/en/diversity.html
[4] http://www.cordis.lu/fp6/inco_policies_to_do.htm

International co-operation (INCO) represents an important dimension of the Sixth Framework Programme. As a contribution to a European Research Area open to the world, it will be implemented in the Sixth Framework Programme through three major routes (Cordis website):

1. The opening of "Focusing and Integrating Community Research" to third country organisations with substantial funding;
2. Specific measures in support of international co-operation;
3. International activities under the heading of Human Resources.

Participation and funding of third country participants is also possible in the other headings of the Framework Programme. There is 600 million Euro foreseen for international co-operation according to the second activity of the Treaty, of which:

- 285 million Euro for participation from the targeted third countries in "Focusing and Integrating Community Research"
- 315 million Euro to fund "Specific measures in support of international co-operation". In support of the external relations, including the development policy, of the Community, these measures target also NIS countries, including the Ukraine, Belarus and Moldova.
- In addition, substantial funding under the heading of Human Resources is foreseen.

When participating in thematic priorities of FP6 (Integrating ERA block), NIS countries are entitled to the same standing as Member States, except countries from NIS cannot coordinate a project. In 'Structuring and Reinforcing' block of FP6 NIS countries can participate if it is essential for the project or foreseen in relevant Work programme.

In general, participants from third countries have to follow the same procedures as participants from Member States. Participants from third countries[5]:

- have to be invited into the consortium by the European participants, or
- get active themselves to become invited into the European consortium.

3. Conceptual framework of NIS Science and Technology structure

3.1. Soviet model of Science and Technology System

The Soviet R&D system had a unique institutional structure, the principal organisational form of which was an independent industrial research institute. Central industrial research institutes were part of the ministerial structure co-ordinating innovation process activities. Both enterprise R&D and university R&D was rather limited. While industrial institutes or 'branch science' were reasonably well developed, in-house or enterprise R&D was relatively modest[6]. R&D in the institutes was directed by ministries, who could also dictate the demand side as enterprises were

[5] Different rules apply for " Specific measures in support of international cooperation
[6] Radosevic, S. What Future for S&T in the CEECs in the 21st Century? 2004.

state owned. Academy of Sciences was mostly responsible for coordinating fundamental research efforts.

W. Meske outlines the following characteristic tendencies, which happened after the former socialist world S&T 'dissolved' (Meske 1998, pp.39-40):

- **Politics withdrawal from its responsibility for science** by dispensing with state planning, dissolving the ministries and other bodies formerly responsible and by granting the universities and Academy of Sciences autonomy. In all cases this was associated with a substantial reduction of state funding; in most countries these reductions by far exceeded the general level of economic downturn as a reaction to the prior overestimation of science.

- **Politics withdrawal from its responsibility for the economy.** The introduction of market economy mechanisms, the conferral of responsibility on the enterprises and in particular their privatisation all led to the downfall of the former framework of industrial R&D and innovation. With the dissolution of industrial branch ministries, the branch R&D institutes lost not only their management and funding basis but also the most important co-ordinating body for connections to the enterprises. Because the enterprises themselves were struggling for survival in the market economy, they were seldom interested in maintaining and, above all, financing the contracts with the R&D institutes, which had earlier often been imposed upon them; to the contrary, they usually even reduced any in-house R&D capacities as a cost cutting measure.

Therefore, the system that was once centrally coordinated through particular ministries found itself fragmented as a result of formation of different independent NIS with national S&T systems, eliminating formerly maintained bridge between science and R&D and industry. As industrial R&D practically vanished, basic research survived with the support of state funding, which was substantially less than it used to be, yet existent. Industrial R&D did not however find support from market, leaving the sector significantly worse off.

3.2. Principles in setting up NIP

The paper continues by settling generic outlines for different NCP systems, describing situation in target NIS countries – Ukraine, Belarus and Moldova – and making recommendations based on situation analyses in terms of efficient NIP organisation in these countries. At the time of preparation of the paper, political decision with respect to NIP organisation has been already made, therefore propositions reflected in this paper do not seek to choose alternative models, but suggest some points making the chosen model ever more effective. The suggestions are based on long term experience of Archimedes Foundation, Estonia, and EU-Bureau of the Federation Ministry for Education and Research (EUB) of Germany, both active as NCP organizations at least for the last 5 years, as well as numerous interviews performed with relevant people (NIP staff, ministry officials, researchers etc) in each of the target country.

From the experience of EU countries there are basically three different modus operandi for establishing National Contact Points as assistive measure to support participation in different EU programmes. As programmes central activity and decisions are made at EU level, for each individual country it is essential to have special liaison body which is able to extract EU level

information and adopt the info to the needs of local R&D communities. In addition, it is necessary to support general interest for participation in international projects, as there is inherent tendency by R&D organisations to prefer national programmes, which are far easier to apply for, yet undermine the international dimension of research and development efforts.

Three different observed forms of NCP operations are broadly the following[7] (see also table 1):

- Agency type NCP organisation. The tasks of NCP are subcontracted to private or public bodies, who operate as agencies within commonly agreed budgetary limits. *De facto* these institutions are independent, though subject to reporting and monitoring to/by relevant Ministry (Estonia, Austria, Netherlands etc).
- NCP hosted directly by Ministry or different Ministries. These NCPs are operating as regular department within the Ministry (Portugal etc).
- NCP dispersed and hosted by different bodies such as research institutions, agencies, universities etc, usually according to the thematic priorities, under the coordination of relevant Ministries. In some cases, especially for the larger countries there is the second tier of NCPs, usually regional NCPs consisting of 1-3 full time employees for all thematic priorities and programmes (Poland, Germany etc).

The following is short assessment of positive and negative aspects of specific organisational structures.

3.2.1. Agency type model

What is termed the "Agency type" model is a division of labour between the policy-making activities by public officials within the government offices and their implementation by the Agency's employees[8].

Strength of agency type model	
+	As Agency operates on competitive grounds, **efficiency** of such an institution **is inherently maximised** by Agency management. Therefore, usage of resources is rationalised and potentially most effective. There is however still danger that Agency and outsourcing body are closely related and competition for service provision is hampered, enabling opportunistic behaviours to take place.
+	**Neutrality of Agency assists in serving all interest communities rightfully and equally**. It requires from the employees of an Agency to be organisationally independent.
+	**Agency succeeds in pooling together ample experience and knowledge under single roof**, acting as 'centre of competence' in the specific field and guarantying sufficient quality of service. It is of utmost importance to maintain transfer of experience and knowledge between different departments and offices within the Agency, in order to comply with this assumption.
+	**Agency** as 'one stop shop' **provides visibility** for the constituency and assists in coordinating dissemination activities associated with the representation of EU programmes.

[7] We do not pretend to cover all possible organisational structures of NCPs, making references to the most common forms

[8] Formica, P. Industry and knowledge clusters: Principles, Practices, Policy. Tartu University, 2002

+	**Underperforming managers can be easily dismissed** or replaced, which sets them higher responsibility for their action. The problem here is the measurement of performance, which should be relatively flexible, yet transparent due to the nature of NCP work.
+	**Management** board of NCP under Agency structure has normally **sufficient power to act on their own**, being not subject of appointment by political parties or vested interest of different economic groups.

Main weaknesses	
-	Agency's **tendency to inflate costs** in order to operate in larger budgetary limits. However, this tendency is constrained by competition between Agencies for the NCP position.
-	**Supervision of Agency's activities is somewhat constrained** by contracting body due to organisational separation. Supervision can be implemented by establishing an Agency's Board with the involvement of the representatives from contracting body.
-	**Acting as government advisory body,** which would convey better impact on policymaking, **is** frequently **complicated**, as Agency does not stem from ministerial structure.
-	In case FP6 Programme committee (PC) members are not from the same organisation (usual case keeping in mind recommended separation of NCP position from the delegate's one), **access to PC information is restricted**.
-	Specific Agency might not have regional representatives, which will **hamper its reach beyond certain geographical area**. If regional offices are established, cost versus benefit might happen to be too high. Therefore, in the case of Agency, partner organisations have to be involved into dissemination work in case Agency is not able to reach all interest groups.

Some of the presented weaknesses can be overcome by certain organisational and administrative actions. At the same time it is necessary to maintain good balance in terms of potential advantages of the structure, since in some cases currently outlined strength can turn easily into weaknesses if not managed properly.

Therefore, Agency should conduct its operations proceeding from the following standards (Ibid):

- Clear and publicly accountable responsibilities are assigned.
- Initiative is supported.
- There is clear focus on needed outcomes to achieve the substantive goals of the Agency.
- Effective and open communication is encouraged amongst all of employees and management to ensure Agency's effectiveness.
- Separate board limited to max 10-12 people, all of whom are sufficiently motivated and committed to devote their time to the job.
- Executives should be held accountable in front of the Board.
- The Board should provide access to main customer groups and have an involvement from policy making bodies.
- The Agency should aim at desirable collective outcomes. For this, Agency should nurture social capital based on networks and mutual recognition of worth between governmental bodies, corporate entities and civil society.
- The structure and management of the Agency should be flat and flexible in order to meet new developments and demands from their customers.

3.2.2. NCP hosted by Ministry

A number of countries have opted for establishing an NCP directly as structural unit of Ministry or different Ministries. Setting up NCP under Ministry has different implications than that of Agency, mainly due to its proximity to policymaking units.

Strength of the model	
+	Being incorporated into the structure of Ministry the NCP organisation can to some extent have positive **impact onto S&T policy**. In practice, it will very much depend on the functions and scope of activities of NCP and its access to policy making process.
+	With sustainable political support, the NCP organisation has good **operational continuity**
+	**Lower administrative and supervision costs** if established based on existing infrastructural resources and feedback schemes.
+	**Proximity to internal policy documents** and better possibilities to concert actions with national S&T initiatives and priorities

Weaknesses	
-	NCP organisation **does not face competitive pressures**, which can easily lead to low efforts and vague dedication to the job. The control over financial expenditures exists, yet the return from these expenditures cannot be sufficiently monitored.
-	NCP organisation will **represent foremost dedicated Ministerial interest**, i.e. the interests of the Ministry of Science, which may lead leaving some groups on the background (i.e. SMEs, multipliers, consultants).
-	**In case NCP is hosted by different Ministries, coordination of NCP structures is more complicated**, as Ministries themselves are organisationally separated and act on different principles and priorities. Thus rivalry between Ministries might impede cooperation within NCP system.
-	The **responsibility of NCP coordinator is not comparable to** the one faced by the Agency **managers**, since allocation of funds depends on the position of the unit amongst other units not that much on the efficiency of the work.
-	NCP hosted by Ministry does not usually have external experts such as Board, therefore **access to advice is more limited** and strategic orientation may lack (low flexibility).
-	NCP organisation management **is not free in its initiative**, having certain position in the overall hierarchy of the Ministry.
-	**Tendency to inflate costs** in order to operate in larger budgetary limits, very common to any bureaucratic structure.
-	**Funding body and performing body in one may dissolve control** over NCP activities, or hinder the transparency in order to refrain from public criticism if this should be the case.
-	NCPs are **not usually experts** in the related field, providing mostly administrative support.

In case NCP organisation is hosted in Ministry the following principles should be applied:

- Certain objectives are set, clear and publicly accountable responsibilities are assigned.
- Involving experts and/or advisory group/board into the activity of NCP.

- Ensure interaction between different units within Ministry and between employees in order to synergise experience and cohere efforts on broader basis.
- Adopt specific strategy towards interest groups who are outside of direct Ministerial policy scope (e.g. blurred responsibilities between Ministry of Economy and Ministry of Science towards SMEs, multipliers, third sector organisations).

3.2.3. NCP dispersed and hosted by different bodies

NPC organisation is sometimes dispersed and amorphic in it's nature – this is mainly the case for larger countries with more dispersed R&D community across the country. Apart of it, in a larger country there is more diverse representation of interests, which can lead to NCP organised under different bodies. Management of such NCP organisation is most complicated, as supervision should be performed across different players, information management and equal distribution is hardly achievable, spill-over of experience is limited due to geographical separation and rivalry. However, as NCP is organised under existing institutions, infrastructural investments are minimised in this case. Also, reach to different interest groups can be achieved with this decentralised body as subsidiarity principle is applied.

Strength of the system	
+	Potentially **wider reach** due to **less centralisation**. However, there is serious danger that NCP established under research institutes will focus mainly on researchers and discard enterprises and SMEs, whereas Enterprise Associations will forget about researchers. Thus, distribution of tasks under different organisations can have direct effect on marketing strategy.
+	Usually appointed NCPs are **experts** in their field.
+	**System embeds rivalry**, which motivates NCPs to perform their tasks efficiently.

Main weaknesses of dispersed NCP system	
-	**Communication and exchange** of best practice and knowledge between different NCP hosting organisations **seriously impeded**. This is almost inevitable if the system is large enough and operating in dispersed manner. Low knowledge spill-over has tendency to result in poor quality of service. Rivalry is another reason for low cooperation between different players.
-	**Supervision** of performance and measuring efficiency **is unattainable** due to large administrative costs and dispersed organisation of NCP system.
-	**Difficult to assess** proper **costs** assigned to the system, as each participating organisation has opportunistic interest to maximise its budget. While in the first two cases there is just one organisation operating, in the latter case there are numerous organisations involved, which turns the inflated costs into serious problem.
-	**Feedback** from Ministry to NCP system in terms of statistics and general performance **is less effective**, communication between NCPs and national delegates difficult as well, though not impossible.
-	**Coordination of the system is complicated** as division of responsibilities is widely scattered and time lag is present due to inert changes.

If dispersed NCP organisation is established the following aspects should be kept in mind:

- where possible limit the variety of NCP host organisations in order to maintain coordinative efficacy, yet picking the best organisations for the job.
- Encourage systematic meetings between different NCP organisations for better exchange of information and involve the representatives of all NCPs into coordination process.
- Maintain competition for the NCP host, cohering competitive calls to the lifecycle of Framework Programmes.
- Encourage cooperation between first tier NCPs with second tier (regional) NCPs by supporting trainings, joint programme of activities etc
- Clear assignment of responsibilities for each organisation and establishing distinct feedback mechanisms.

3.3. Country reports

3.3.1. Ukraine

2.3.1.1. Period in transition

Similarly to the entire Soviet S&T system, the Ukrainian S&T system has altered radically since 1991. Transformation of the S&T system has been affected by cardinal changes in external and internal conditions of its development. **First of all, it is the disintegration of the international socialist science system and co-operation links between scientific centres.** This system was organised within the framework of the Council of Mutual Economic Assistance as bilateral and multilateral forms of co-operation of the research institutions of the former socialist countries. **Another factor that affected processes of transforming the Ukrainian science was the destruction of inner-state distribution of labour and co-operation in science of the former Soviet Union.** The breakdown of S&T system of the Soviet Union has broken links of long standing in research structures and deprived scientific organisations of a very substantial financial support from the government[9].

Ukraine, like any other republic of former Soviet Union inherited the key features of the „Soviet pattern" of S&T system: extreme division into separate sectors, a centralised pattern of funding from single governmental budget, as well as centralised management and control structures. The prevalence of large organisations, insensitive to any change or adjustment of their institutional forms and lack of communication with the world community, created additional problems. Lack of funding in turn led to migratory processes in science. Scientists have opted out of the system by their own will, typically on account of the uncertain future of science and low salary rates. Migration has occurred to lucrative business sectors as well as abroad (Ibid. 2002).

The Ukrainian science and technology system excels in many areas of research, in particular in space studies, theoretical physics, mathematics, the welding industry, protective and reinforcing coatings and biotechnologies.

[9] Kavunenko, L. Ukrainian Science System After Ten Transition Years. Conference Proceedings.

3.3.1.2. NIP set up in the Ukraine

The Ukrainian NIP[10] was established by the Ministry of Science under the Kiev State Centre of Scientific, Technical and Economic Information (The Centre) as a result of INTAS project undertaking. The Centre itself was founded already back in 1969 with the purpose of promoting scientific-technical and innovation investment activities, distribution and manufacturing application of scientific and technical achievements, extension of scientific production management methods and scientific labour organisation, increase of labour productivity and enhancement of product quality.

The Centre is alike of other 19 regional Centres Scientific, Technical and Economic Information, who perform similar tasks on regional level. The largest concurring Centre is located in Lviv. Other Centres are not related to NIP activities, as Kiev NIP is designated to fulfil the tasks of FP6 activities on national level. However, it is most natural to have the regional reach through the existing web of Centres by cooperating with the rest. Thus, NIP advice is present on most of the territory of the Ukraine by means of collaboration agreements endorsed by these Centres, whereas the availability of people and quality of advice depends on the available resources of each individual Centre. The regional representatives are co-funded by the Centre, but also local authorities. However, there are no specifically designated people for this task, meaning that the job is carried out as part-time.

When building up the NIP system, Polish system is well replicated due to similarities of the two countries and geographical and cultural proximity. However, consultancy and support from Poland was not available at the time of the set-up of NIP system in the Ukraine, which has deprived Ukrainians of the experience gained by Polish by the time the system was being introduced in the Ukraine. An advantage compared to Polish system is in the setup structure of NIP – the activities are performed by one distinct body on both, central as well as regional level. This enables maintaining organisational transparency and wide reach of the services at the same time.

The Ukrainian NIP is subordinate to the Director of the Centre, being yet separate unit within the organization, and consists of administrative personnel of 3 full-time persons, who consult on FP6 in general. FP6 thematic co-ordinators are appointed by the Ministry and they reside outside of NIP, mainly in the leading universities or research centres. FP6 thematic co-ordinators are in most cases related to the Academy of Science, who was the institution which performed NIP tasks in FP5. Thematic co-ordinators are not operating full time and are engaged into consultancy predominantly in the cases when assistive thematic information is needed. Due to the professional engagement of the thematic coordinators into their everyday assignments as scientists, their knowledge on FP6 is however weak and time for consulting work very limited.

At this stage, when generally FP6 is unknown to the potential constituency, the prime aim of the NIP is to focus on information dissemination mainly. It covers distribution of electronic newsletters, face to face meeting with research community, information days and thematic

[10] The information in this section is based predominantly on individual interviews with the Ukrainian NIP personnel, foremost with Ms O. Koval

presentations at the assistance of thematic coordinators. NIP has established an extensive database of potential FP6 participants, and main information on FP6 and partner searches is distributed through dedicated mailing lists.

Information on active participants is acquired from Cordis databases, meaning that operative information on the FP6 participation is not accessible by the NIP. On the other hand, due to the peculiarities of national scientific system and financial hardships potential and active FP6 participants are not interested in sharing the information with NIPs. At the present stage NIP have gained overview of the active Ukrainian organisations through scanning the Expressions of Interest, and as a result identified around 83 organisations potentially interested in the programme.

The target groups, mainly universities and research centres, are approached in traditional ways using mailing, telephone calls, information days and newsletters. The mailing list covers around 500 contacts, contact database is also kept and developed.

Mostly people approach NIP with the questions related to project funding and administrative aspects, as well as Intellectual Property Rights and distribution of commercial gains from the exploitation of IPR. The funding issue is one of the most problematic as universities understand they are obliged to invest 50% of their own resources into the project (this point should be clarified further in order not to give wrong signals to the constituency).

In terms of the training, the most important aspects that are indicated by the NIP are questions related to setting up an effective NIP system, the assessment of so-called ’best practice’ cases and transfer of the RTD results to the Ukrainian context. Still, it is evident that in-depth information on FP6 is not available to the NIP and performed INTAS trainings were useful though not sufficient enough.

Being a structural unit under the Centre provides NIP with the unique possibility to have some impact on STI policies, as the Centre operates as advisory body to the government of the Ukraine. Having distinct signals from the constituency, one is able to convert existing gaps existent on RTD landscape into policy measures, which can have positive impact on STI environment and thus also on international RTD cooperation.

With respect to scientific strongholds scientific activity is distributed between different regions of the Ukraine – main scientific centres being Harkov and Odessa next to Kiev. Ukrainian scientists have excellence in cybernetics, semiconductors, radiophysics, electronics, chemistry of molecular compounds, low temperature physics, solid state physics, micro-electronics, bionics, new aspects of theoretical physics, quantum chemistry, geochemistry, physics of minerals, mathematical work on oscillation of synchro-phastrons and satellite orbits, controlled thermonuclear fusion, mechanized engineering and radio engineering and automatic control theory. They have also mounted investigations in applied gas dynamics, aerohydromechanics, solid state mechanics, thermal engines, and hydraulic engines of high parameters, problems of the "boundary layer" in aerodynamics and aerodynamic wing theory. However, the leading fields in terms of FP6 are material and nanotechnology, space related research as remnant from the former military industry, and biotechnology.

Table 1. SWOT analysis of Ukrainian NIP system

Strength	**Weaknesses**
a) Authorised central body co-ordinating FP6 national activities, ability to handle information in centralised manner and serving as one-stop-shop for clientele b) Basic personnel is employed full-time with basic state help, though motivation is not high due to low overall operating budget for NIP activities c) NIP is built on existing and functioning structures, having thus good set of experience and contacts d) There are no organisational limits in cooperating in EU projects, attitude is more or less conductive to active participation (low inference into grant distribution) e) Direct link of CNTEI Kiev (NIP host organisation) with Ministry of Education and Science, which facilitates NIP communication with other institutions f) Existing NIP has capable personnel and knowledge in FP6 g) S&T system is for Ukrainian organisations conductive to participation in FP6 and necessitating the existence of NIP h) Database of research and scientific organisations is present, more than 530 contacts in e-mailing lists and databases i) Good personal and scientific relations with experienced Polish research partners.	a) Information exchange between Ministry of Science and Education and NIP is somewhat elusive due to insufficient political support b) NIP limits itself to contractually binding activity of information dissemination, however proactive approach is lacking due to low financial basis and low experience in proposing and submitting FP6 proposals c) NIP is very much dependent on INTAS funding, which is temporary and very unstable d) Communication with INTAS office is not supported sufficiently from INTAS side e) Contact base with EU research community is vague, also little interest from EU researchers' side f) Misunderstandings on the level of Ministry of Science and Education *versus* Academy of Sciences affect directly the efficiency of NIP system, as thematic coordinators are from Academy of Science g) There is no salary for thematic coordinators foreseen, thus their motivation is largely insufficient h) Access to trainings of NIP personnel is very restricted as they are from the third countries and not supported by the Commission i) Insufficient statistics from FP participation and missing feedback from Ukrainian participants impeding effective work j) Existing scepticism towards EU programmes widely recognised and orientation towards US funding predominant k) There is no government support present for successful EU

	project proposers l) Multiple reporting to different national bodies and INTAS – no multilateral coordination m) Limited access to internet/digital divide/language barriers very problematic points for Ukrainian constituency
Opportunities	**Threats**
a) Growing interest in EU S&T cooperation and project possibilities from Ukrainian scientific community b) Tax exemption from S&T related grants having effect on enlarged participation c) NIP Ukraine receiving higher independency which will help to reduce administrative burden of the organisation and facilitate the involvement into everyday practical consulting work d) Successful participation of Ukrainian scientists in FP6 projects (up to now very limited) will rise interest towards FP6/FP7 e) Inclusion of NIP into the framework of state funding f) Increasing interest of EU in S&T cooperation with so called third countries g) Twinning possibilities with EU NCP institutions as well as NIPs and researchers in other NIS	a) Unstable funding and relations by INTAS office may endanger the national funding of NIP, as Ministry is not fully convinced of the necessity for NIP office. b) Ease of access to US funds crowd out interest towards FP6 c) Practice with funded EU projects will change and funding will be directed to general accounts and monitored by central bodies d) Large number of unsuccessful projects will dilute interest towards FP6

3.3.1.3. Recommendations and opinion: NIP Ukraine

The approach of the Ukrainian Ministry of Science to establish NIP under Kiev State Centre of Scientific, Technical and Economic Information complies well with the characteristics of the Ukrainian S&T structure. Due to dispersed scientific activity across the country it is most prudent to outsource the activity to dedicated Agency, which has sufficiently well represented regional reach. Positive aspects associated with the approach are:

- The Agency committing the tasks is experienced in industrial innovation support activities, which adds professional scent to the services and helps to add value for the customer through the range of additional services. It is therefore important to maintain close contact between NIP unit and other units within the Centre.
- The Centre is neutral body, having equal access to research bodies, enterprises as well as support structures. There is existing contact base with research community, which is useful in performing FP6 tasks, as most of FP6 projects are market oriented and suitable for the Centre's constituency.
- As independent body the Centre has incentive to participate in FP6 projects itself assisting NIP in their dissemination work and giving good experience to NIP staff.
- The Centre provides NIP with the unique possibility to have some impact on STI policies, in order to foster and rationalise the establishment of national STI programmes as well shape the RTD environment in the country on whole.

The above mentioned characteristics constitute opportunities for the NIP organisation, which should be harnessed through well streamlined activities.

However, the following aspects should be considered at the present stage of set-up of NIP:

1. Relative distraction of thematic co-ordinators from NIP main office and organisation has adverse impact on the efficiency of NIP work. Thematic coordinators are mostly active as professional scientists having very little time to dedicate on consulting and administrative issues. This fact in turn keeps their motivation low in studying FP6 thematic priorities and developments within and to share the knowledge with wider constituency. Separation of thematic coordinators from each other and NIP personnel does not facilitate of best practice and experience exchange, which is essential element in achieving efficiency of the established system.

2. The present structure of the system is natural outcome of the process that has been taking place well before the establishment of formal NIP under the Centre. At that time, Academy of Sciences was responsible for the FP5 representation in the Ukraine, having thus basic structure present also for FP6. However, as the tasks of NIP were shifted towards more neutral body – the Centre, within the FP6, Academy of Sciences was left with thematic coordinators who *de facto* have to assist dedicated NIP personnel in promoting the activities of the Programme. Evidently, this *modus operandi* does not enable achieving high efficiency of FP6 consulting. Situation could be better if NIP under the Centre managed to include thematic coordinators under their jurisdiction and have dedicated thematic coordinators who are able to spend certain amount of time on administrative work. In some cases it might require hiring people who are not

professional scientists in the field, yet efficient in administrative aspects and highly motivated.

3. Independency of Centres might start impeding standardized approach in setting up the system of regional NIPs. Presently, bilateral agreements are endorsed between the Centre and regional Centres providing also certain financial stimuli for organizing basic NIP activities within those Centres. Generally, this is rational approach, however one should provide also regular training to regional NIPs or people who perform the task as NIP in regional offices. The agreements should be endorsed primarily with the Centres which cover the regions where scientific activity is most intensive. Thus it means, that NIP reach is not necessary in terms of all regional Centres, but focus on most promising ones (Lviv, Odessa, Harkov, etc). There should definitely a financial backup from the Government in order to maintain the interest of regional Centres. It is enough to have 1-2 person having basic knowledge of FP6 on regional scales in order to signpost more concrete questions to the NIP personnel in the Centre. Those people should be paid for their working hours based on the contract between regional Centre and the Centre, and from the budget of local authorities.

4. The Centre's inherent proximity to Ministry operating as advisory body provides the Centre with an excellent possibility to impact national STI strategies and shape national RTD programmes. This possibility should be exploited in order to search for synergy between national coordination and EU support in research domain. Through healthier local S&T environment it is also higher possibility to be successful internationally, which would considerably strengthen the position of NIP in Ukraine.

5. Current orientation of NIP advice onto leading research groups and institutes is indeed productive approach. Nonetheless, there is also high potential embedded into large, formerly R&D intensive state owned companies, who have restructured their processes when adopting to market economy. Some of these enterprises have still well qualified personnel and opening new R&D cooperation opportunities would facilitate their shift back to more knowledge based production. Currently lack of market outlets in the West and relatively poor contact base and cooperation can be overcome by collective projects with western partners who might become suitable channel for subsequent marketing of their RTD results. Hence, NIP should aim at filling the gap between academia and industry by attracting them into common projects.

6. A number of outlined problems in SWOT analysis refer to lack of funds, insufficient reach towards EU scientific community, limited experience with project proposal writing and managing. A number of these problems can be partly overcome by more active involvement of NIP in FP6 instruments such as SSAs and CAs. For these purposes NIP should look actively towards possibilities of being engaged into such projects and utilise the possibility in streamlined and well defined manner, perhaps at the assistance of experienced consultants or similar experienced bodies from EU member states. Also, there exists practical need for further trainings of NIP and Ukrainian constituency towards participation in EU framework programmes.

3.3.2. Belarus

3.3.2.1. Country S&T profile

Before gaining its independence in 1991, Belarus (namely, the staff of its 300 organisations involved into R&D and 30 000 people, including 17 700 researchers and 8 200 technicians) has been tightly integrated into the common structure of the single scientific and technological space of the former Soviet Union (FSU) with its 3 thousand research institutes under 20 Academies of Sciences which was rather closed to the world[11]. The links and cooperative relations between particular organisations followed the patterns of labour division planned for all the republics of the FSU. With the part of technological innovations being adopted from Russia, Belarus has represented the strong technological fortress in metal-processing and new materials, micro- and optoelectronics and some biotechnologies. In the Soviet Union period, Belarus has been one of the most industrialised countries in the world with about 45% of industry in the GDP, and has held the third place for S&T among the republics of the USSR[12]. Its capital city, Minsk, ranked sixteenth in the world (and fourth in the FSU) in scientific output.

With this all, the scientific system was previously oriented on carrying out of large-scaled strategic state R&D tasks; the most significant expenditures were made on military purposes. In mid-90-es, it has been decided to refuse from such military orientation; hence the thematic directions of R&Ds should have been changed to the benefit of country's civil needs in building of the knowledge-based technological area. After splitting of the Soviet system, Belarus has inherited alongside with its independence the high energetic dependency from Russia on oil and gas; because the whole structure of economy has leaned on low prices on energy before, this has called for necessity to choose between falling into economic dependence from Russia again, or restructuring of economy for the less energy-intensive and more resource-saving productions (which is currently proclaimed to be one of the priority directions of the state development). The need has been felt for small-steps incremental technological innovations, for more small-sized projects with the shorter period of completing the science-intensive product and technological innovations, and accordingly for the actors able to develop fundamental knowledge for the needs of industrial market, which under conditions of economic crisis turned low-solvent.

New challenges of economic structure and changes in customers' demands could only be met by new forms of organising the R&D process. In all Post-Soviet R&D systems they have started to arise through "survival strategies"[13], where inter-organisational restructuring (as splitting of institutes) has prevailed over restructuring which would involve several institutions from different sectors. Though privatisation processes in science have been very slow in Belarus, as novel forms of R&D organising there have emerged the research-based small firms, spinning-off from large public research institutions (state laboratories) aimed at commercialisation of ideas of technological innovations developed by companies' founders during previous research career.

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[11] Pobol, A. (2004). Development of Scientific and Technological System in Belarus. In: Supporting the Development of R&D and the Innovation Potential of Post-Socialist Countries. Ed.: Walter Filho. NATO Science Series 5: Science and Technology Policy - Vol. 42. IOS Press.

[12] Nesvetailov, G.A. (Ed.) (1991) Scientific Potential of the Republic. Nauka i Tekhnika, Minsk.

[13] Radosevic, S. (2004). What Future for S&T in the CEECs in the 21st Century? In: Werner Meske (Ed.) From System Transformation to European Integration: Science and technology in Central and Eastern Europe at the beginning of the 21st century. Münster: Lit Verlag. Pp.443-478.

Nowadays, the sector of entrepreneurship in S&T sphere of Belarus embraces a rather wide diversity of various forms. More than 130 entrepreneurial structures have been created in Belarus under the structure of the National Academy of Sciences and the research organisations in its framework. However, survival rate of them is small, and the share of entrepreneurial structures acting in the sphere of R&D amounts to only one per cent of the whole SMEs sector, rather thin by itself. This reflects in *low BERD level*. Domestic expenditures for R&D in Belarus are reaching 104 mln. USD or 0,73% GDP (2003). In that, the share of budget financing in GERD is 48.6% (2003).

Belarus has inherited the developed industry and good infrastructure, there is sufficient knowledge and willingness to develop and cooperate but the real possibilities are extremely limited. SMEs are in their very early stage of development. Private initiative is not supported on the national level. Although legally anyone could start his own business, the formal procedure is so complicated, that many of those who start, give up halfway.

A problem of large *regional concentration of R&D resources* is relevant: 80% of researchers are situated in the capital city Minsk, and 70% of R&D expenditures have been allocated here. All bigger universities are situated in Minsk. The best in the rank is Belarus State University – a classical university followed by the State University of Informatics and Radio-electronics, State Technical University and State Medical University. Also there are observed the regional diversities in *innovation rate among SMEs*[14].

As also in many other countries of the FSU, large *gap between fundamental research and introduced in industry innovations* exists; in the structure of scientific system of Belarus the expenditures' ratio "research to developments" on different stages of the research process constitutes currently approximately 1:1.2. The reason lays in that the fundamental and the prevailing share of applied research are with the relative stability supported by budget funds, whereas *alternative sources for financing* the applied research and developments from domestic and foreign industrial investors *are lacking*. Newly introduced schemes of organizing the applied research are to provide tighter links between science and industry through industry-shared project funding and rigid control on whether the results of state S&T investigations half-funded by state are industrially introduced and mastered by enterprises.

However, Belarus entered the 21st century with an open, export-oriented economy. Nearly 60% of the country's GDP is organically linked to the external marketplace leading to a high degree of national dependency upon global economic trends. Share of products with high science-intensity in export in 2002 was 4.2%, of medium high science-intensity – 13.8%[15]. Export of Belarus to CIS countries has constituted 55% of the whole export, of which 90.5% was export to Russia. Major trade partners of Belarus outside CIS are Germany – 6.1% of turnover, Great Britain - 3.2%, Poland – 2.9% and Netherlands and Italy – each 2.1%. The highest share of high-tech exports to CIS countries are electron integral schemes and TV sets; to the countries outside CIS

[14] Shehova, M. (2001). Statistical Observation of Small Entrepreneurship. In: Belarusian Economic Journal, No. 4.

[15] Slonimski, A.A. and Linchevskaja, O.S. (2003). Transfer of Technologies: State Regulation and Role of Small Enterprises. In: Belarusian Economic Journal, №. 4.

exported are electronic integral schemes and micro schemes, optical, photographic, measuring and medical devices, diodes, transistors and analogue. While the EU is Belarus's main trading partner outside the New Independent States, for the EU trade flows with Belarus are marginal (0.1% of EC trade). This puts forward the issues of developing the international cooperation.

At the moment Belarus faces a serious task to balance economy, develop its competitiveness and sources of growth to which Belarus primarily attributes intellectual potential of the nation – science, education, innovation activity of the people.

Though being an open economy as for products and labor market, Belarus in fact has a very low *integration into the world technological network.* Till now, only 7% of industrial enterprises have supported technological collaboration with foreign countries (2002). 544 collaborative projects have been performed by industrial enterprises in 2002, whereby 75% of partners have been from Belarus, and 20% - from Russia. Russian capital is in most cases the only available funding for the companies; however, there also exist some problems with the involvement of and cooperation with it.

Generally, *connection of R&D sphere to foreign investments* is still occasional; foreign funding to R&D in Belarus mostly origin not from corporate business but from international scientific cooperation programs and projects. The distribution of funds upon fields of sciences shows that the largest share of foreign funds has been not surprisingly invested into technical sciences (89.5% of all foreign funds invested into R&D in 2002). Existing cases of business investments into, e.g., German "Karl Zeiss" (optics, systems of electronic visualization), "Alcatel SEL" (introduction of mobile telephony system of GSM standard and commutation equipment production), "Fresenius AG" (medical equipment production), Dutch "Maersk Medical Ltd.", Swiss "SB Telecom Ltd." are however considered to be successful cases of FDI into knowledge-intensive industries in Belarus.

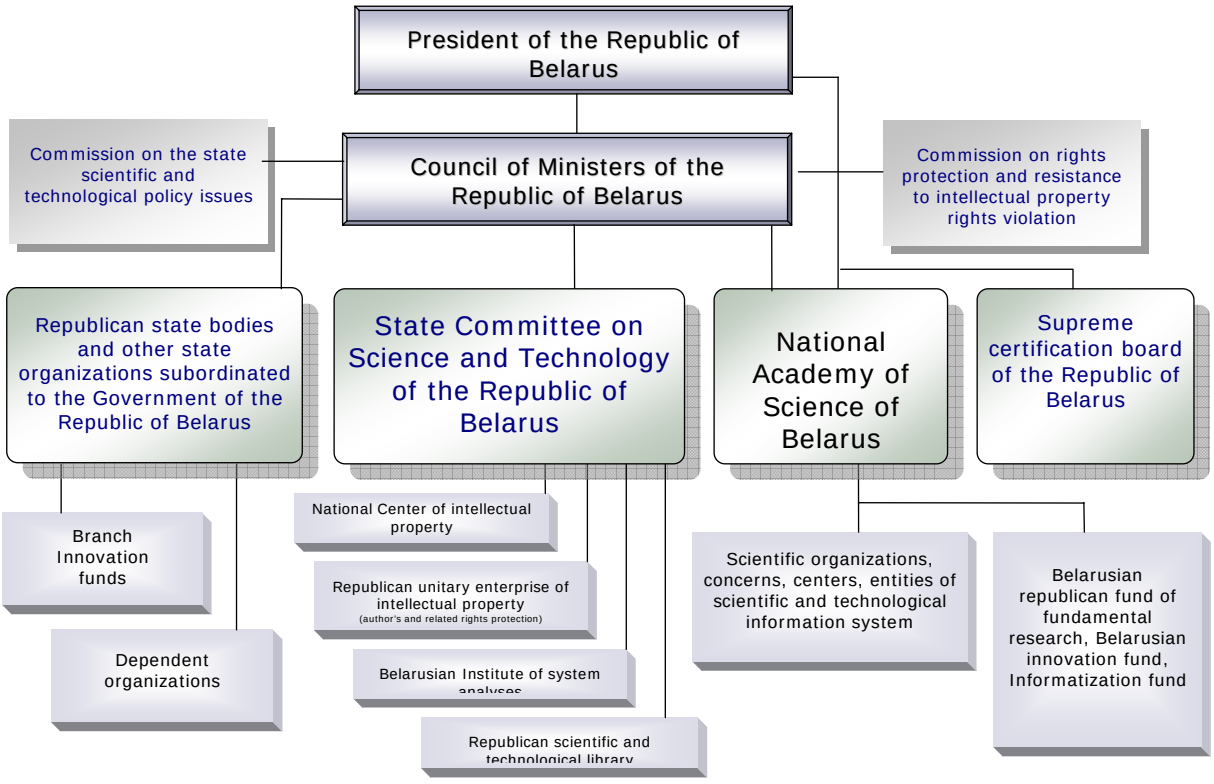
Still low is participation rate of institutions in FP6, though capacities of S&T collaboration is very high. National R&D development programme identifies 6-7 priorities, which basically coincide with the thematic priorities of FP6. They embrace: Health, Chernobyl disaster consequences liquidation, Environment protection; Agriculture; Energetics and Transport; Informatisation and telecommunications; Resource-saving, new materials and technologies; Machining and radioelectronics' competitiveness; development of State. **Nanotechnology** is represented by numerous research institutions, **ICT** – national strength lies in software development, system solutions, computer industry (INTEGRAL), television industry (located in Vitebsk, cooperating with Philips**), Life sciencs, Biotech**, material technology, powder metallurgy

System of the state management in the field of R&D was reorganised in 2001-2002 and now consists of three main actors: the State Committee for Science and Technology, National Academy of Science and Supreme Certification Board. The legislative base for state management of the S&T sphere in transitive conditions has been worked out in Belarus already in 1993. Applied R&D are carried out and realized mostly in the framework of State scientific and technical programs (SSTP), as well as innovation projects (IP), branch, and regional scientific and technical programs. Now, there are Belarusian State Foundation for Fundamental Research,

Foundation for Informatisation of Belarus, Belarusian Innovation Foundation and numerous branch innovation foundations, that structure relationships of state and researchers apropos R&D.

The growth of investment into R&D and its effectiveness is one of the main tasks of the State Committee on Science and Technology (SCST), which is a republican body of state management ranked as a Ministry (see the scheme below).

System of state management in the field of science and technology



The major objectives of SCST are as following:

- implementation of public policy in the sphere of scientific and innovation activities, including international activities, as well as in the intellectual property rights protection;
- coordination of governmental institutions' activities in the spheres of R&D and innovation activities, as well as in the IPR protection;
- organizational and economic regulation of R&D and innovation activities, as well as of the IPR protection;
- improvement of the structure of the scientific and technical capacity and enhancement of its efficiency;
- ensuring control over compliance with the legislation of the Republic of Belarus on development of R&D and innovation activities and IPR protection, as well as over the use of the Republican budget funds allocated to R&D including international cooperation.

Development of international S&T cooperation including cooperation with EU for the benefit of R&D organisations without regard to their subordination is SCST's power. Thus it was natural to organise NIP under SCST's protectorate.

In future the NIP should develop into a completely new and independent non-profit institution, preferably public. The founders should be all interested groups. Funding should come from the state budget via the State Committee for Science and Technology. The activity might be wider and include both free of charge and paid services.

So far there is almost no private consultancy service in the market except for small legal consulting companies but if the situation changes, a possibility of cooperation with such companies may be considered

3.3.2.2. NIP System in Belarus

The NIP system[16] in Belarus is evolving. Although launched in September 2003, the first activities started only in January 2004. In August, permanent personnel were hired in the embodiment of one NIP employee. There are 2 people involved into NIP activities on top of that, however they work not full time. General attitude of the decision makers is, that what they have today is a temporary project, and neither accession to EU nor participation in framework programmes is a national priority. The officials are not motivated to support the initiative either financially or otherwise, presently everything has been set up more or less at the assistance of INTAS grant. This in its turn impedes from employing full-time personnel, as nobody wants to give up their permanent job for something uncertain. Nevertheless, the first wider publicity event was arranged in April with the involvement of local media and reception for decision makers, and second largest in 27th of October at the involvement of experts from Archimedes Foundation, Estonia, and EU Bureau, Germany.

The present personnel include:
- the head (part-time, his main position is within the European Humanities University),
- Administrator – secretary (the only full-time employee)
- IT specialist, also IST contact person (part-time, his main position is in the Institute of Informatics)
- consultant, Nanotech contact person (part-time)

Besides they have contact persons-consultants for biotech/environment/health and mechanical engineering. So far there is an opinion that NIP will not cover all thematic priorities of FP6.

A NIP personnel is able to offer the following services:
- information dissemination
- general questions about FP6 and other cooperation projects and funding opportunities
- construction of a web site

[16] Information presented in this chapter is based on interviews conducted with Belarus NIP personnel, mainly with Ms. I. Fedorova and Mr. A. Mikheyshin

- consultations on all stages of proposal preparation
- electronic proposal submission
- advise on the partner search sites
- help with the use of computer and internet
- consultations during the project implementation (financial issues, project management, legislation, problems with customs)

Basically interest has been expressed in INTAS calls – questions about proposal submission, eligibility criteria, filling in the application forms, possibilities for partner search (information is given only about the possibilities, no actual partner search is done). Practical assistance in off-line proposal preparation and electronic proposal submission (only a limited number of people have access to internet). During the project – questions about the use of funds, management, eligibility of costs, national legislation, customs regulations, taxation. Construction of NIP web site is still in progress, therefore all problems must be solved by either personal contacts or by phone, in some cases also by fax or e-mail.

The present grant for launching the NIP system was applied for by the Institute of System Analysis, as the State Committee for Science and Technology as a national agency did not qualify for application. However, the connection between NIP and the Institute is only formal. NIP is developing into an independent project. Advisory Board of 5 members includes the members of the Academy of Sciences, scientific committees and universities.

The head of the NIP system has good experience with INTAS projects since 2000. He has consulted all stages of proposal preparation, is well informed about administrative requirement, eligibility criteria etc – all this has been of considerable help to get into the system of the Framework Programme.

Belarus research community has no obligation to register or inform in any other way about their participation in a FP project or preparation of a proposal - there is no similar system as in the Estonian universities, where, as a rule, proposals are registered in the R&D department. Therefore the NIP personnel has no overview of the participation in Belarus institutions in FP6, so any useful information from the continuing advice providers is very welcome. The above explains also, why the potential proposers have not searched actively for consultations and assistance from the NIP staff.

Interviews with local NIP actors revealed that the community might be interested in the following topics for training courses and seminars:
- comprehensive overview of FP6
- EU priority research topics
- Partner search and partnership offers (how to present ones skills and experience)
- Added value of the Belarus researchers to the EU research area

The next step after official opening of the office is a mapping exercise to identify the interest groups and possible contact persons in major research institutions, who could disseminate information among their fellow researchers. This should be followed by a set of regional information days. Belarus is divided into six regions – Minsk, Grodno, Vitebsk, Mogilev, Brest,

Gomel. Total number of research and higher educational institutions is about 299, which employ 41900 researchers. It is prestigious to study in a university and get higher education. There are already 12 private educational establishment in Belarus.

Figure 1. RDTI Funding System in Belarus

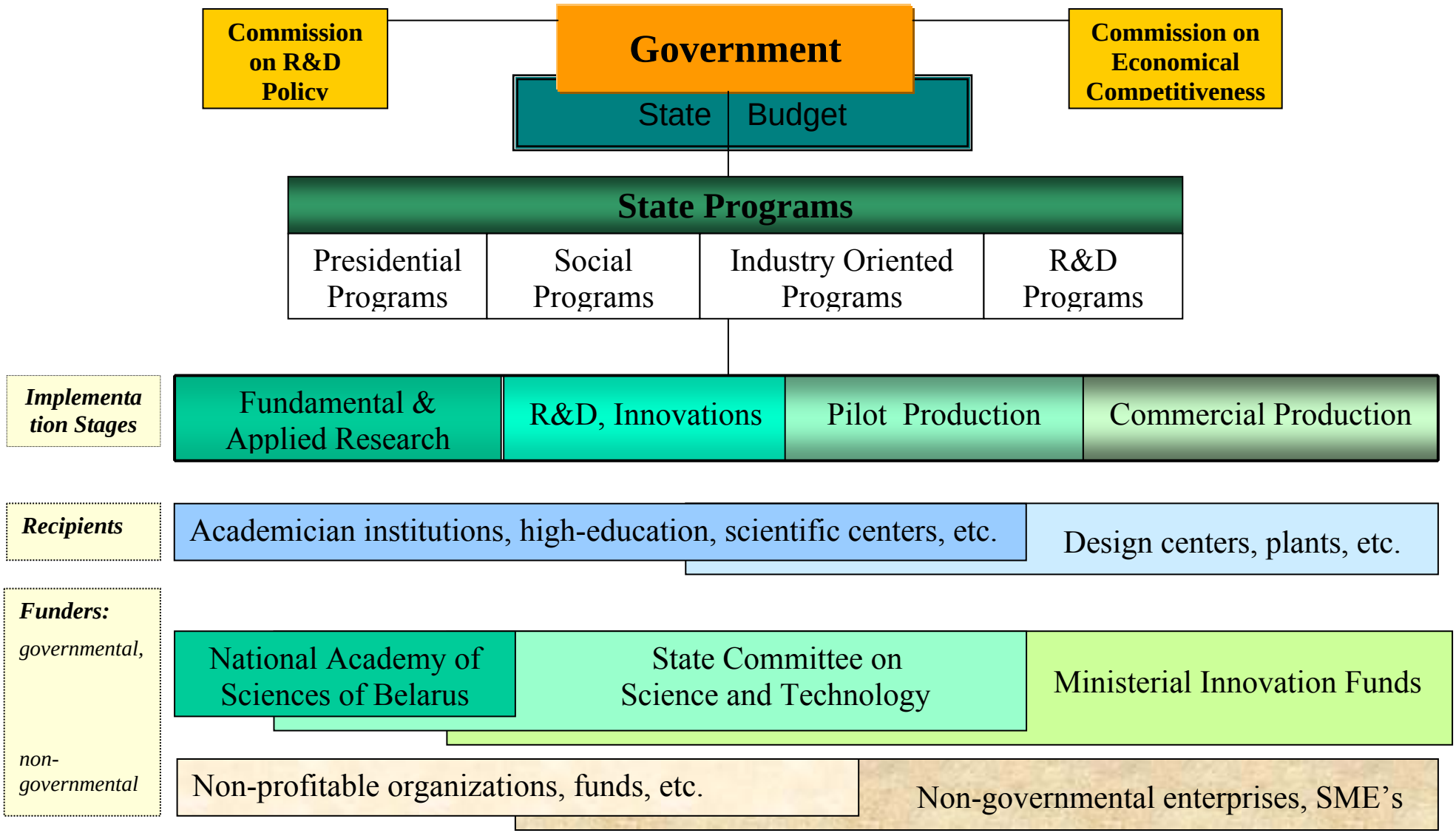


Table 2. SWOT analysis of Belarus NIP system

Strength	**Weaknesses**
j) Acceptance of State Committee to establish NIP in Belarus. For these purposes certain funding is present, but mostly based on separate application i.e. for organisation of information events, conferences etc. k) Existing NIP has qualified personnel and director, who have experience in previous S&T projects and management. l) Infrastructure for S&T is relatively well supported in Belarus and the quality is satisfactory (actually the best in NIS countries) m) Strong fields of S&T are related to engineering, electronics and machinery n) Database of research and scientific organisations is present o) Cooperation between State Committee and Belarus universities is good and mutual p) Good personal and scientific relations with Russian and Polish research partners.	n) NIP is operating only on the basis of INTAS funding, which is temporary o) There is only one full-time personnel working at NIP, therefore lack of time is pressing (personnel can work after normal working hours) and motivation to work is not sufficiently maintained p) EU is not the priority in terms of S&T cooperation for a country as a whole q) There is no government support present for successful EU project proposers
Opportunities	**Threats**
h) Renewal of former S&T contacts with former partners from NIS i) Inclusion of NIP into the framework of state funding j) Increasing interest of EU in S&T cooperation with so called third countries k) Twinning possibilities with EU NCP institutions as well as NIPs in other NIS	e) Political voluntarism can endanger the proper functioning of NIP f) Instability of NIP staff can pose serious constraints on NIP work in case experienced staff decides to resign from the work g) Omissions with respect to INTAS contract may endanger the future funding of NIP, leading to closure of NIP due to lack of funding.

3.3.2.3. Recommendations and opinion: NIP Belarus

The support of INTAS to Belarus for establishing local NIP office has been decisive and should be highly recognised. Participation in EU structures does not hold high ranking on the Government's priority list[17], therefore state support in the phase of the establishment of the NIP has been modest - most of the funding for the establishment of NIP has come from INTAS. Thus, one of the challenges for Belarus NIP is to purport convincingly the necessity and value of NIP undertaking in order to guarantee sustainability for the NIP activities for the remaining continuum of FP6 and for FP7, whereas the latter one will turn into major STI policy instrument on European scales with almost double funding.

Decision to form NIP under the roof of State Committee on Science and Technology can be welcomed, as it hopefully will make it easier to:

- convince Ministry and government in the necessity of such structure provided the Committee will manage to create best practice cases through augmented participation of Belarus in FP6 activities;
- act as highly recognised body with good credentials and scientific background, utilising its wide network of contacts with RTD community;
- provide political sustainability for actions as State Committee ranks high in the existing R&D support system.

The following are recommendations for the establishment of NIP and for increasing the efficiency of NIP everyday activities. These recommendations are non-exhaustive, however we believe proper realisation of the recommendations could significantly contribute to the success of Belarus participation in FP6.

1. It seems that success of NIP is very much pending on political support, which is missing at the moment. Therefore, NIP should gain higher visibility through public events and intensive dissemination, prepare action plans for future activities with certain objectives defined, and articulate the benefits from S&T related cooperation with European Community. Ever increasing budget for INCO activities is one indication of European willingness to support international cooperation, Belarus in turn can benefit from European funding in strengthening its own scientific base.
2. Presently, NIP staff is predominantly occupied part-time, which has certain impact on the efficiency of their work. Usually NIP personnel are able to dedicate themselves to work after normal working hours, when they have finished their daily work. The implication of this is low motivation and lack of time to dedicate more seriously on administrative work that NIP position entails. Our suggestion is to establish full-time positions for NIP, if not for all thematic priorities then at least generic NIP who is able to perform basic dissemination and consulting work, whereas thematic NIPs can enter the scene when more in-depth information is needed.
3. In the long run, it is necessary to have permanent state support for NIP activities. With the termination of INTAS contracts NIP activities should be pursued further, and local

[17] S&T cooperation is gaining considerable scales with Russia

funding should be allocated for covering basic costs. NIP can actively search for matching funding from alternative EU resources, but this should not be the only source of financing.

4. NIP should seriously utilise twinning possibilities with EU NCP institutions as well as NIPs in other NIS. One possible way is to initiate projects under INTAS framework, establishing basic contacts with European scientific community.
5. Likewise in the case of Ukrainian NIP, we advise to focus activities next to research institutions also to the leading R&D intensive enterprises. As a positive heritage from former Soviet Union, some of these enterprises have capacity to cooperate in the field of R&D, especially in the sectors like electronics, biotechnology, material technology, military. Currently lack of market outlets in the West and relatively poor contact base and cooperation can be overcome by collective projects with western partners who might become suitable channel for subsequent marketing of their RTD results. Hence, NIP should aim at filling the gap between academia and industry by attracting them into common projects.

3.3.3. Moldova

3.3.3.1. Transition to new S&T system

Science and technology system during the 90ies in the Republic of Moldova was undergoing evident crisis. The crisis has particularly affected facilities and disciplines oriented towards applied research. It has also posed major setbacks on general innovation activities. The necessary transformation of the science and technology system has yet to occur.[18]

Likewise in other NIS, one of the problems, which Moldova faces, is the reduction of resources allocated to science and technology activities. The impact of the continuing economic decline and the political instability are both effecting severely the situation in Moldova.[19]

Similarly to the entire Soviet S&T system, the Moldavian has also gone through radical changes in the beginning of nineties. Approximately 30,000 scientists in the Republic of Moldova were left without a primary source of funding when the Soviet Union dissolved in 1991. These scientists include hundreds of experts in microelectronics and avionics.

Currently Moldova is trying to restructure its S&T system with the help of United States. Moldova in cooperation with CRDF (The U.S. Civilian Research & Development Foundation (CRDF) is a nonprofit organization that promotes international scientific and technical collaboration) is trying to preserve the world-class research and innovation occurring. The Moldova Science and Technology Development Program is consistent with this goal. The collaborative nature of the Program ensures that the United States will reap technological and economic benefits as well.

[18] Vladimir Kramarenko, What is the fate of S&T in the Republic of Moldova? In Meske, Werner, Judith Mosoni-Fried, Henry Etzkowitz, Gennady Nesvetailov (Eds.), "Transforming Science and Technology Systems - the Endless Transition?", NATO Science Series 4: Science and Technology Policy - Vol. 23.

[19] Werner Meske, TSER project “Restructuring and Reintegration of S&T Systems in Economies of Transition”

In keeping with the CRDF's nonproliferation goals, the joint program will actively seek the participation of researchers who are former defense scientists. Additionally, the CRDF and the MRDA (The Moldovan Research and Development Association) will make inclusion of young scientists a priority in their ultimate funding decisions, thereby ensuring that the Moldovan tradition of groundbreaking science and engineering will continue well into the 21st century.[20]

The MRDA – located in Chisinau, Moldova - is a nonprofit, voluntary, self-financing organization registered with the Ministry of Justice of Moldova. The goals of the MRDA are to (1) promote scientific research and technological development in various fields in conformity with international standards, as well as to develop the scientific and engineering potential in the Republic of Moldova and to (2) provide direct funds (grants) for scientific research and development projects on a competitive basis. The U.S. Civilian Research and Development Foundation (CRDF) has been instrumental in providing material support, training and guidance to the fledgling organization.[21]

But both the MRDA (Moldovan Research and Development Agency) and of Moldavian science is far from secure. First of all it is not clear for how long will the US State Department continue propping up former weapons researchers and Moldova's spending on R&D is still very problematic – 0.18 % of GDP is spent on R&D.[22]

March 20 in 2005 is a crucial date for further development of the national R&D system – a starting date of the reform of the whole R&D system. The problems of transition period should be overcome in four months and in early August, hopefully, the restructured system will be able to function properly. It is hard to give any concrete numbers or facts, as nothing has happened yet. The most visible change is that Academy of Sciences will become even more powerful - it will become the most important decision making and funding institution. Earlier the whole research funding and coordinating system initiated from the Ministry of Education

It has become clear that steps should be taken for increasing the prestige of research and development activities, attracting young people to higher education and research, wider application of research results (to be funded by the Agency of Technology Transfer) and increasing considerably the salaries of senior researcher staff. Stimulating award system is being introduced as well as the election of the scientist of the year.

The academia-industry communication has been very limited so far. Only 2% of utility models find their way to industrial production. Unfortunately there is no demand for research on national level. The research support system is only on paper and not functioning in real life. Economic problems have caused a situation where more than 1 million Moldavian citizens are working abroad bringing about 600 million dollars to the country.

A number of new institutes are planned to be founded – Institute of State and Law among them. The existing institutes with strong potential and wide renown in physics, chemistry and mathematics will continue their work. Other areas with competitive potential are information

[20] http://www.crdf.org/News/mrda_backgrounder.html, 09.06.2004
[21] same
[22] Banishing Moldova's Demons, Science, vol 304, 21 May 2004, www.sciencemag.org

technology, biotechnology, medicine, pharmacy, new materials, plant physiology and genetics. At the same time a strong pressure and unfavourable conditions could be observed in national sciences.

Today the research community faces a number of problems considerably complicating their position and limiting their freedom of activities – international community is very reluctant to cooperate with Moldova, where remarkable difficulties are experienced in keeping science and politics separate from each other. Although the president of the country is looking towards west, the politicians limit themselves to Bosnia and Herzegovina and Albania which explains to great extent their choices and preferences. Researchers have limited access to internet – a very important means of international communication and source of information today. High fluctuation rate of personnel in the ministries complicates the communication with those institutions and affects the quality and the outcome of the policy making process. Another issue is Russified town of Tiraspol with whom all attempts to make any contact have failed so far. Due to 'historical' and political reasons almost all national heavy industry is in Transnistrian region which has been separated from Moldova and declared itself a republic. The existing national industry includes footwear production, textile, perfumery and pharmacy. Electronic industry did not survive in changing times.

On account of scientific strength, main R&D activity is performed under the roof of Academy of Sciences. At present, in the Academy of Sciences fundamental and applied researches are conducted in the following fields of science: problems of mathematics and informatics; theoretical physics; solid – state physics; micro- and optoelectronics; transfer processes in electric and magnetic fields; geological and geophysical processes; physical and technical problems of power engineering; chemistry of coordinated compounds; bioinorganic chemistry; physiology and biochemistry; microbiology; ecology; protection, renewal and rational utilization of flora and fauna; physiology of stress; genetics, medicine; history; linguistics and literature; philosophy; ethnography; art; economy, etc[23]. After the R&D reform, Academy of Sciences will be responsible for technology transfer activities as well.

3.3.3.2. Establishing NIP system in Moldova

The Moldavian NIP was officially formed in September 1, 2003 although some services have been available earlier - since March, such as information dissemination, access to computer, consultations, information events in universities etc. At the present time the NIP personnel includes 4 part-time people, all of them involved in addition in other tasks and obligations. So far there is no clear division of tasks – each person is able to do whatever is required, and no fixed system of activities which situation might change after hopefully successful implementation of launched reforms of national research system. The continuously updated NIP database includes some 150 research institutions and ~700 researchers. In most of the universities the NIP team has managed to find a contact person. Unfortunately cooperation possibilities of universities with NIP depend on the attitude and willingness of their rectors, who make such decisions personally. Nevertheless universities have helped with consultations on thematic priorities, as there is no budget allocation for respective permanent NIP personnel yet.

[23] Academy of Sciences, Moldova. Buclet, 2004.

Previous experience of the key person includes 12 years of consultations in INTAS information point, coordination of foreign relations in the Centre of Optoelectronics (import of equipment, customs formalities, visa formalities, communication etc), personal experience in international R&D cooperation as a PhD researcher in the Laboratory of Semiconductors etc. A lot of preliminary work and information search has been done out of office hours on a personal computer at home.

Project manager, scientific secretary of the Centre of Electronics, is also a contact person for nanotechnology and web master of NIP. He can be characterised by significant personal project management experience.

Formal main coordinator is an academician who communicates on state level, signs official letters, opens meetings etc. Hierarchy seems to be quite rigid.

General level of knowledge is comparatively low, which conclusion has been drawn from the questions asked so far – covering every possible aspect of international cooperation, framework programmes, participation in projects, proposal preparation and submission etc. Thus, the first trainings for the research community should address primarily, how to write a competitive proposal – administrative forms, eligibility criteria, selection of calls, partner search, eligible costs, on-line and off-line proposal preparation tools, proposal submission etc.

Moldavian researchers have some experience with INTAS (about 20 projects) and INCO-Copernicus. About 30 young scientists have applied for young scientists' grants from which 10% manage to get a degree in 3 years. About 20 applications were sent to the first call of FP6. Unfortunately there is no reliable statistics available about the applications, although the proposers are expected to register in their employing institution. They do, however, register in case of success as otherwise they have to pay all taxes

Although the real work will start hopefully in the near future, there are strong rumours, that the NIP is well funded institution – altogether a very bad starting point in a country with low income level and economic problems.

Table 3. SWOT analysis of Moldovan NIP system

Strength	**Weaknesses**
• The NIP personnel has good experience with international projects • NIP personnel has received good practical training concerning the Framework Programme • NIP personnel has exemplary reach to the Universities and research institutions. • Local NIP has experience in organising the Framework Programme related seminars. • The entire NIP system is operating under the Academy of Sciences, which results in low fragmentation and good communication. • The Academy of Sciences is nominated as national body responsible for innovation activity in Moldova • Willingness of Academy of Science to maintain NIP also in the future under its roof	• All project accounts are transferred into one centralized budget in the Ministry of Finance – there are no separate accounts for international projects • Lack of bilateral S/T contracts makes cooperation with other countries difficult • It is hard to participate in EU programmes because the level of national financing of science, thus research capacity is very low. • There is no national financing for the NIP activities, it is operating only on the INTAS grant. The government supports only with existing infrastructure (office space mainly) • Communication with the INTAS office is problematic - funds are constantly delaying. • There is no national support to cover the costs for project preparation phase and co-funding.
Opportunities	**Threats**
• Negotiations on bilateral S/T agreements are in progress with southern European countries and INTAS. With INTAS the agreement will be endorsed hopefully in one year's time • National financing for project preparation could enlarge the possibilities of successful participation for bringing in national experts and facilitating the communication with potential co-operation partners	• NIP system is unstable, because it is hard to predict the structural changes in the Academy of Sciences. • Low success rate in EU Framework Program is resulting in a very low motivation for participation and US provided grants are much more attractive to the potential participants. • Integration of Moldova into the European Research Area is problematic due to low national financing of local research.

3.3.3.3. Recommendations and opinions: NIP Moldova

New development in Moldova with respect to the restructuring it's national S&T system in the beginning of 2005 will provide Academy of Sciences with more responsibility for running national R&D system, thus potentially will result in somewhat stronger position of NIP also in this framework. It might be somewhat unbalanced to run the activities of NIP from Academy of Science, as consultation is predominantly done with academic researchers, however the capacity of local industry in R&D activities is very low, and thus it is prudent approach in the case of Republic of Moldova.

Therefore, the positive aspects regarding the establishment of NIP under the Academy of Sciences are basically the following:

- solid position of Academy in the framework of national S&T system can assist NIP structures in popularisation of Framework Programme and attract potential researchers into being involved in international EU R&D projects.
- High scientific and administrative qualification of NIP personnel plays important role in attracting Moldovan researchers into the activities of Framework Programme. This however is of utmost importance, as US funds tend to be far more popular finally leading to the transfer of knowledge bypassing EU.

Still, we have the following recommendations, which might to a large extent ever improve the performance of NIP as well as increase Moldovan participation in Framework Programmes.

1. Presently one of the most disadvantaged aspects of participating in EU R&D projects is the fact, that international funding schemes are administered centrally by the Ministry of Finance, which gives very limited independence for researchers, low flexibility and delays in funding. High interference by the state into individual R&D projects sets distinct frames to the participation and interest towards being involved into EU Framework programme, as it means higher administration and time horizons in parallel communication with the Ministry and European Commission. Therefore, we would suggest redesign of current schemes of *modus operandi* and have EU funds directly transferred on separate account owned by participating institution.
2. NIP should be proactive in communication with Academy of Sciences and the Ministry with an aim to purport the endorsement of bilateral S&T agreements with INTAS and individual EU countries. It will provide better environment for initiation of different R&D projects and will enable Moldova to be involved actively in EU research undertakings.
3. Academy of Sciences is very suitable roof for NIP to operate, however in the future Academy should take decisive steps in safeguarding financial sustainability of NIP office. Once INTAS funds will end, Academy should find substitute funding from their own resources to maintain stability of actions. The experience of Estonia showcases clearly the value of funding separate National Contact Point office, which is the platform and initiator for many new projects and capacity-building of local research organisations.
4. As Moldova is relatively small country, it cannot rely on massive participation of researchers in EU structures. Therefore, NIP should act as a catalyst in initiating themselves different projects and attracting local partners into the projects with an aim of

long term capacity building. Moldova finds itself science-wise in similar position with Estonia, where most of the scientific groups are small and overloaded with work, however in Estonia we have managed to provide positive impulse by taking the lead in formation of international consortia and initiation of projects which have afterwards resulted in repetitive partner search and new projects. Thus, the NIP activity should in this case be very focussed on individual high level performers and proactive approach at their involvement.

5. It is most important to identify European leading R&D networks in the domain where Moldova has comparative scientific advantage. Further on, active dissemination towards these networks should be undertaken and placement into the network activity strategically pursued.

4. Summary

The present concept paper for establishing national information points in the Ukraine, Belarus and Moldova aims to analyse the current state of S&T in the above countries and provide prudent and clear recommendations for organising the NIP activities and organisational structure based on this information.

The paper describes general S&T situation in these countries after the collapse of Soviet Union, which had drastic effect also on local research activities, outlines the possibilities of these countries to participate in international R&D networks, predominantly in the context of Framework Programme, analyses advantages and disadvantages of different NPC set ups and applied the knowledge to the existing NIP structures in the Ukraine, Belarus and Moldova.

The core part of the paper is focussed on recommendations, which could be applied while developing the NIP structure in the NIS countries. We do not pretend to provide a panacea for all the problems existing in NIP activities, however we believe that some of the recommendations could significantly improve the performance of NIP and enforce the participation of NIS scientists in FP6.

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Annex I. Different set-ups of FP6 NCP system across Europe

			Types of organisations involved					
Country	n° of NCP staff (full-time equivalent)	n° of organisations involved	Ministry	Higher Education	Public research organisation	Private Enterprise	Other	If other, specify
Austria	43	11	x				x	NPO's contracted by public bodies
Belgium	11	6	x				x	Governmental Agency, Business Federation
Bulgaria	NA	5	x	x	x	x		IRC
Cyprus	3,2	10	x	x	x	x	x	National Research Funding Organisation
Czech Republic	11	1					x	private not for profit organisation
Denmark	6	1					x	Authorised Technological Institute
Estonia	7	1					x	Private non-profit organisation
Finland	10	8	x		x		x	Governmental funding organisations
France	14	32	x	x	x		x	associations
Germany	40	12	x		x	x	x	Technology Transfer Agency, Public Private Partnership
Greece	11	5	x		x	x	x	
Hungary	5	3	x				x	National Atomic Energy Office, Hungarian Space Organisation
Iceland	3	4		x			x	
Ireland	7	10	x		x			Semi-State Agencies
Israel	14	1	x	x				
Italy	18	4	x		x			
Latvia	11	2					x	Professional NGO: Baltic Chapter of SPIE and IRC
Liechtenstein	1	1				x		
Lithuania	7	1					x	Agency for Intern. Science & Techn. Development Programmes
Luxembourg	1,5	1					x	National Inovation Agency
Malta	5	3	x	x		x		
Netherlands	31	1	x					
Norway	8	1					x	Research Council
Poland	46	12		x	x			
Portugal	11	18	x	x				
Romania	3	5	x	x	x	x	x	
Slovakia	5	10	x	x	x			
Slovenia	8	3	x					
Spain	9	8	x	x	x	x	x	National Agency for Technological Development
Sweden	12	3					x	Public body
Switzerland	22	12		x			x	Private non-profit organisation
Turkey	13	1			x			
United Kingdom	46	32	x	x	x	x	x	Govt owned contractor

NA=Not available