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THE INNOVATION POLICY OF THE BULGARIAN ACADEMY OF SCIENCES

Abstract: Since 2001 a process of restructuring of the scientific co-operation among the countries of Southeast Europe and between them and the rest of Europe is going on. A lot has been achieved in building of networks of co-operation among the scientists and scientific institutions with the support of the UNESCO Venice Office-BRESCE, the Central European Initiative and last but not least the European Commission via the FP's and the special programmes for the so-called Western Balkans. However, much more has to be done for inclusion in these networks- but also in other forms of co-operation- of the entrepreneurs in Southeast Europe, which will be the fundamental prerequisite for economic development of the region. The processes on the regional level should be facilitated and catalysed by strong reforms within the national R&I&I systems because only strong national elements may form efficient networks.

The aim of the present communication is to present in some details the on-going reform in the Bulgarian Academy of Sciences as a National Research Center aiming the strengthening its position in the national R&D&I system. It begun with a very comprehensive evaluation of BAS Research Unites organized in 2009 by ALLEA („All European Academies": the European Federation of National Academies of Sciences and Humanities) and ESF („European Science Foundation"). This peer-review based evaluation, which involved some 40 internationally renowned scientists working for almost a year through the material provided by BAS researchers, and conducting several thousand hours of site visits in Bulgaria, was the first to scrutinise any institution in Bulgaria in such detail. BAS was found to be, in an international perspective, by far the leading scientific institution in the country.

As a National Research Center, following the example and the good practices of such leading European non-university research bodies like Max Planck Society in Germany and C. N. R. S. in France and many others also throughout Europe, the Bulgarian Academy of Sciences organizes its activities around four main axes:

– Carrying out fundamental research
– Carrying out applied research

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** The paper is given in terms of PowerPoint presentation.

– Providing services to the State in the fields of meteorological and hydrological forecast, monitoring the solid Earth (seismic activity) and atmosphere dynamics, monitoring the environment, etc.

– Training masters and doctors together with Universities.

This rather complex mission takes stock on the good positions the Institutes of the Academy won during the past 60 years via extensive international co-operation. In the early nineties aroused the necessity to fill the gap left after the disappearance of the system of corporate institutes which had as a main task the science applications in the former state-planned economy. Since that time BAS developed fruitful relations with many industrial firms, for the time being mostly from abroad.

In 2010 the number of the research units was reduced from 69 to 42 and they were grouped in nine problem-oriented divisions substituting the traditional disciplinary departments. The new divisions should stick better to the structures of the national economic players and the educational establishments in the so-called innovation triangles needed not only for the Bulgarian economy but also for a stronger and economically more efficient regional co-operation.

BULGARIAN ACADEMY OF SCIENCES IS:

- National research centre composed of research unites (institutes);
- National learned society in all sciences and arts fields – Assembly of the Academicians and Corresponding Members

The reform in BAS is aiming to:

- Achieve more efficient management and exploitation of the research infrastructure;
- Improve the conditions for major problem-oriented research;
- Develop innovative activities and cooperation with the business representatives;
- Expand the activities that are vitally important for the Bulgarian state;
- Establish the interdisciplinarity in scientific studies;
- Make academic careers more attractive in the eyes of the younger generations in order to be increased significantly the number of the PhD students and the young scientists and scholars;

Reform stages:

- International Assessment (ESF-ALLEA, 2009)
- Juventisation of employees - 430/130 -8.5%
- Structural changes - 69/42 - ~ 1.3 million levas (administration);
- Employees attestation - ~ 3200 scientists and scholars; 3700 – scientific personnel; 350 - administration.
- New Statutes of the Bulgarian Academy of Sciences; Elections of new governing bodies – at all levels

NEW PROBLEM-ORIENTED DEPARTMENTS IN BAS:

- **1st Information and Communication Sciences and Technologies (4 institutes)**
- **2nd Energy Resources and Energy Efficiency (2 institutes)**
- **3rd Nanoscience, New Materials and Technologies (10 institutes)**
- **4th Biomedicine and Life Quality (6 institutes)**
- **5th Biodiversity, Bioresources and Ecology (3 institutes)**

- **6th Climate Changes, Risks and Natural Resources (4 institutes)**
- **7th Astronomy, Space Research and Technologies (2 institutes)**
- **8th Cultural and Historical Heritage and National Identity (7 institutes)**
- **9th Man and Society (4 institutes)**

BAS INNOVATION STRATEGY

- Expansion of patent activities

  BAS Patent Office

  147 patents maintained by BAS in 2009

  174 new patent applications

  BAS maintains **60-70 %** of the Bulgarian patents in the average for the last 10 years

  Issue: Lack of finances to maintain the patents!!!

- In 2009 – 625 joint projects with Bulgarian organizations
- On average annually 120 new solutions are introduced into practice

Pro-innovation structures within BAS

1. "GIS Transfer Centre" (2000)
2. "Innovation Center" (2006)
3. Technology Transfer Centers in BAS Institutes
   - Space Research Institute
   - Institute of General and Inorganic Chemistry
   - Institute of Mechanics

All of them are assisting SME's
for participation in EU FP7

PROJECTS funded by the National Science Fund, under 6FP and 7FP

IN THE PERIOD 2007-2009:
80 projects with companies and other organizations

NATIONAL INNOVATION FUND PROJECTS

320 projects in total for 4 sesions

28 BAS institutes participate in **70 projects**
(universities – in **20** projects)

Areas: nanotechnologies, new materials, new energy production technologies, genetic and medicine, bio-technologies, machine building, environment, etc.

Issue: BAS lacks financial resources for co-funding.

GOOD EXAMPLES:

1. Nano tool Shop Ltd., Botevgrad
   Central Laboratory of Solar Energy and New Energy Sources, BAS
   Integrated MEMs censor for bio-chemical application

2. Herti JSC, Schoumen
   Institute of Mechanics, BAS
   Technology for production of Al caps

3. Artchim Ltd. Sofia, TDP Group Ltd Plovdiv
   Institute of Physical Chemistry, BAS
   Strengthening the Corrosion Resistance with Nano-composits

CREATION OF STARTING COMPANIES BASED ON SCIENTIFIC PRODUCTS DEVELOPED BY BAS INSTITUTES

- Development of a Policy and Regulations on Intellectual Property, based on EU recommendations (from April 2008) and on National Financial Audit Office recommendations(from December 2008)
- Development and Approval of Regulations on BAS Business Activities
- Analysis of 130 intellectual property products developed by BAS and identified as such of high potential for commercialization

1. "UNITEST" OOD

Institute of Mechanics, BAS

patent

Subject: AUTOMATED NONDISRUPTIVE CONTROL SYSTEM OF THE STRUCTURE OF MATERIALS.

2. "Hydro-MiNa" OOD

Institute of Mechanics, BAS

4 patents and know-how applications

Subject: DEVELOPEMNT, RESEARCH AND PRODUCTION OF ROBOT-ASSISTED MYCRO- AND NANOTECHNOLOGICAL SYSTEMS, DEVICES AND THEIR ELEMENTS AND MODULES; MARKETING

3. „TAKT-IKI" LTD.

Space Research Institute - BAS

IP: patents and know-how

Subjects of activity: CONSULTING, ENGINEERING, COMMERCE WITH INNOVATIVE AEROSPACE TECHNICS AND TECHNOLOGIES.

4. „High-Tech IMS" LTD.

Institute of Metal Science - BAS

IP: patents and know-how

Subjects of activity : HIGH TECHNOLOGY EQUIPMENT AND SYSTEMS

5. „INNOVATIVE FOUNDRY TECHNOLOGIES" LTD.

Institute of Metal Science - BAS

IP: patents and know-how

Subjects of activity : PROVIDING OF SERVICES, TECHNOLOGIES, KNOW-HOW

6. „WELDING INNOVATIONS" LTD.

Institute of Metal Science - BAS

IP: know-how

Subjects of activity : TESTING AND APPLYING OF INNOVATIVE WELDING PROCESSES, AS WELL AS OF MACHINES FOR THEM

7. "VITANEA" LTD. – Plovdiv

Institute of Organic Chemistry with a Centre of Phytochemistry

IP: patent and know-how

Subjects of activity : PRODUCTION OF FRUIT JUICES AND NECTARS, FOOD ADDITIVES, PECTIN

8. "HOLOBUL" LTD.

Central Laboratory of Optical Storage and Processing of Information CLOSPI - BAS

IP: patent and know-how

Subjects of activity : PRODUCTION OF NANO-TECHNOLOGY PHOTOSENSITIVE MEDIUMS.

9. "ELCOBO" LTD.

Institute of Information Technologies - BAS

IP: patent and know-how

Subjects of activity : SCIENTIFIC RESEARCH AND DEVELOPMENT OF OPTICO-ELECTRONIC AND NIGHT VISION DEVICES.

10. "AOP" LTD.

Central Laboratory of Photoprocesses

IP: know-how

Subjects of activity : INNOVATIVE TECHNOLOGIES FOR OPTICAL COATINGS.

TECHNOLOGICAL PARKS. PRELIMINARY TECHNICO-ECONOMICAL PROJECT SURVEYS

1. **Technological park "Sofia-Iskar"**
   (Sofia Technological park)
   BAS, Municipality of Sofia, Innovative companies – Denina 2000, EuroBul Innovation, Pulslight, Lightsystems
   Photon-, Micro- and Nanotechnologies

2. **Technological park "Plovdiv"**
   BAS, ACA, Universities, Companies
   Food, Biotechnologies

3. **Technological park "Pomorie"**
   BAS, "Prof. Assen Zlatarov" university– Burgas, companies
   Renewable energy sources

TECHNOLOGICAL CLUSTERS

- MECHATRONICS AND AUTOMATIZATION CLUSTER – BLAGOEVGRAD centre
- LASER TECHNOLOGIES CLUSTER – PLOVDIV
  (in the process of creation)
  (BAS, IE-BAS, ISSP-BAS with the participation of 25 companies)
- YACHTBUILDING CLUSTER – VARNA
  (in the process of creation)
- ELECTROMOBILES CLUSTER –
  (in the process of creation) (BAS, Institute of Electrochemical Power Sources, Central Laboratory of Solar Energy and 15 companies)