Republic of Serbia
Ministry of Science and
Technological Development

R&D STRATEGY & NATIONAL FUNDING IN SERBIA

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PRESENTATION OVERVIEW

1. Strategy of Science and Technological Development of the Republic of Serbia 2010-2015
   - Science in Serbia Today
   - National Research Priorities
   - Key elements of Strategy implementation

2. Serbian R&D Infrastructure Investment Initiative

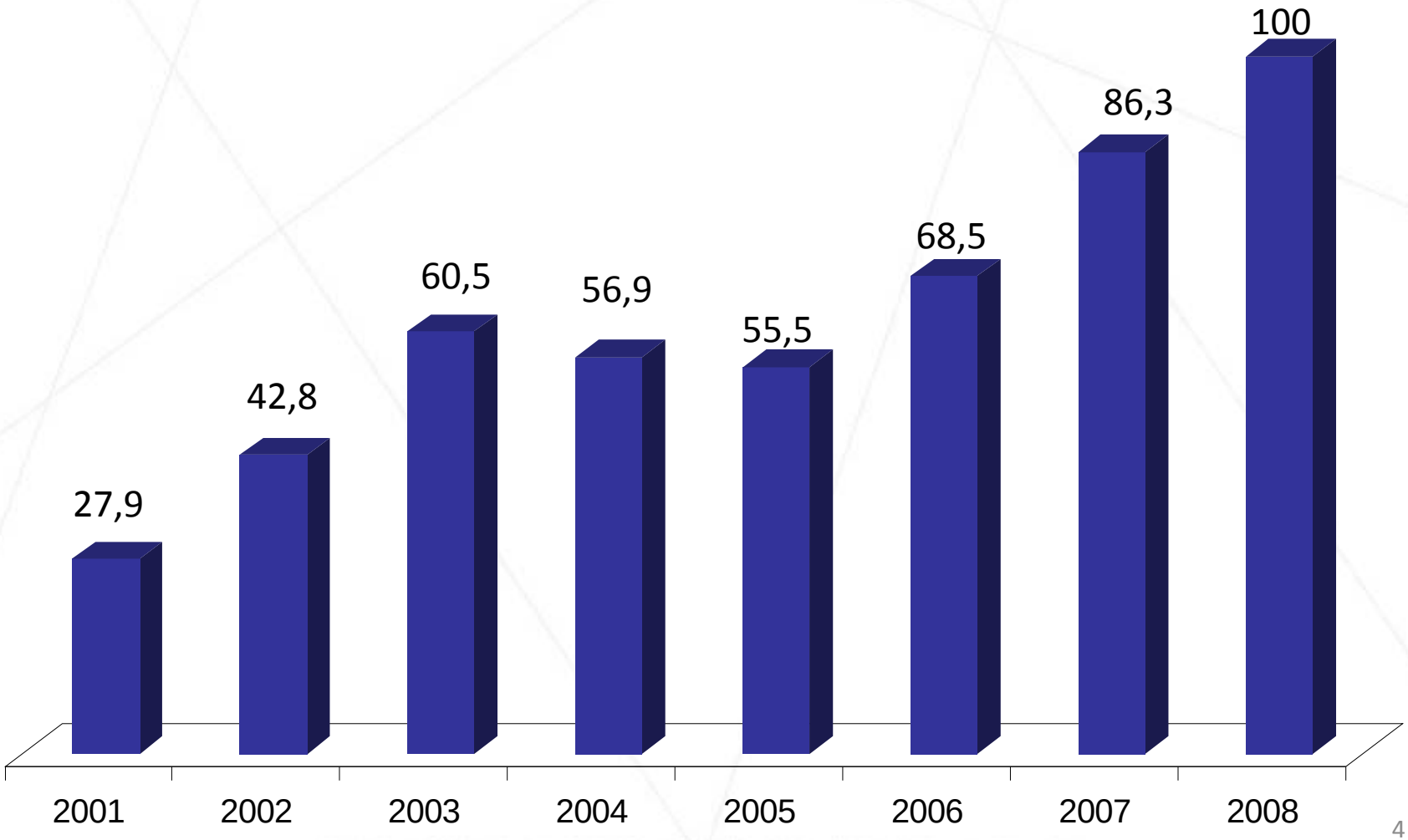
STRATEGY OF SCIENCE AND TECHNOLOGICAL DEVELOPMENT OF THE REPUBLIC OF SERBIA 2010-2015

VISION

Serbia as an innovative country where scientists reach European standards, contribute to the knowledge of the entire society and the technological development of the economy

PUBLIC R&D EXPENDITURES HAVE BEEN RISING SINCE 2001

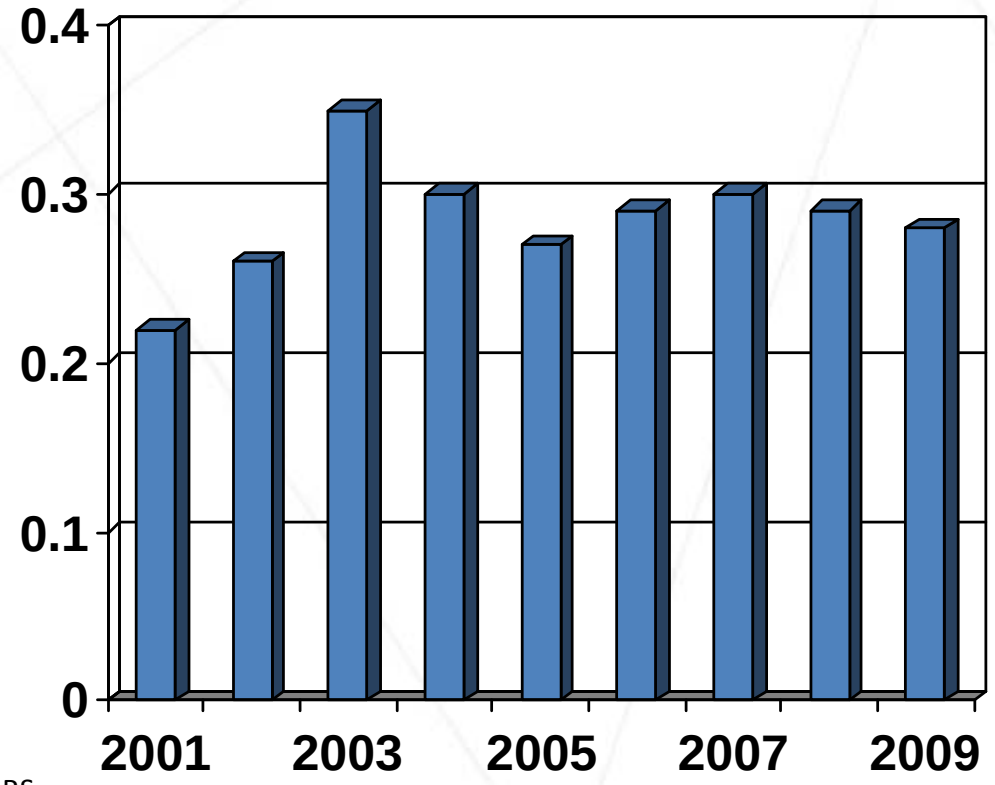
Government expenditure on science and technology (in millions of euro):



Source: Budget memorandum

HOWEVER, IN % OF GDP, EXPENDITURES HAVE STAGNATED

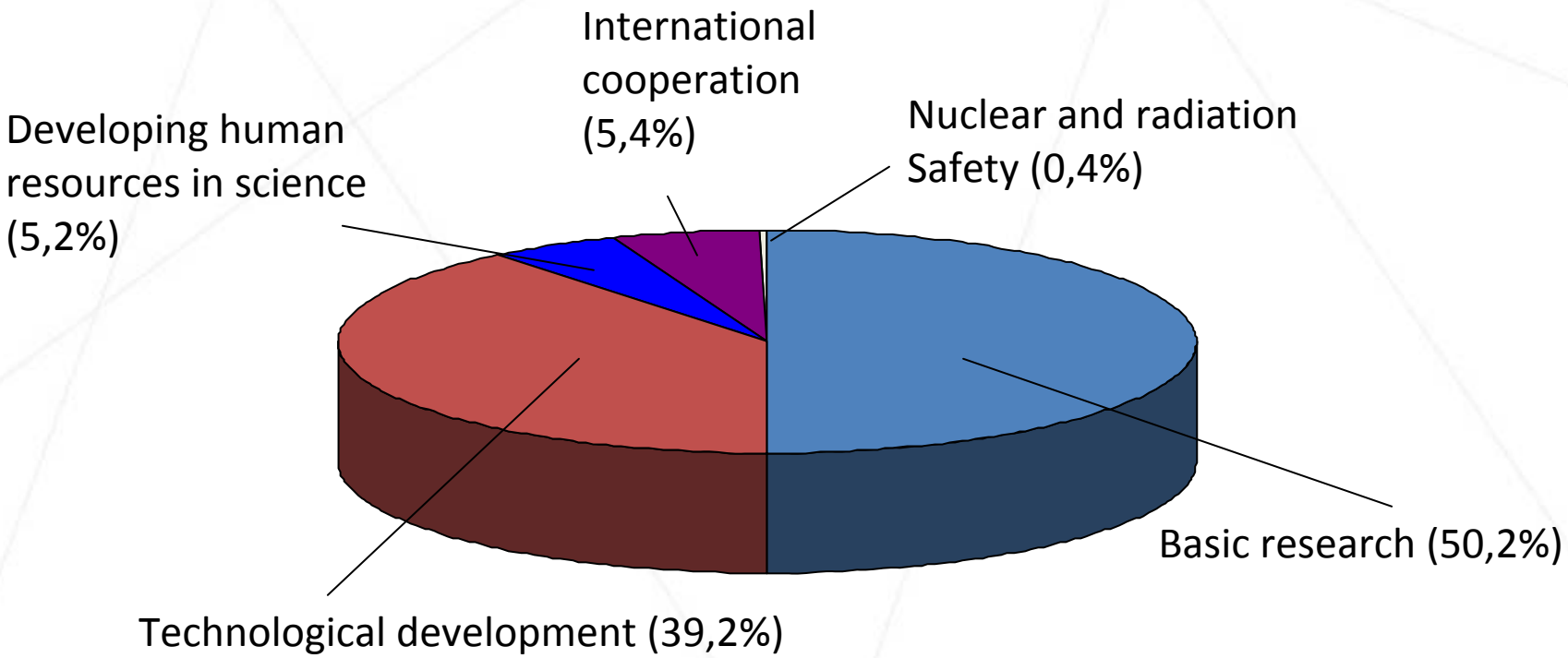
Budgetary R&D expenditures
(in % of GDP, not counting the National Investment Plan):



Source: Law on budget RS

THE BUDGET IS PREDOMINANTLY SPENT ON BASIC RESEARCH

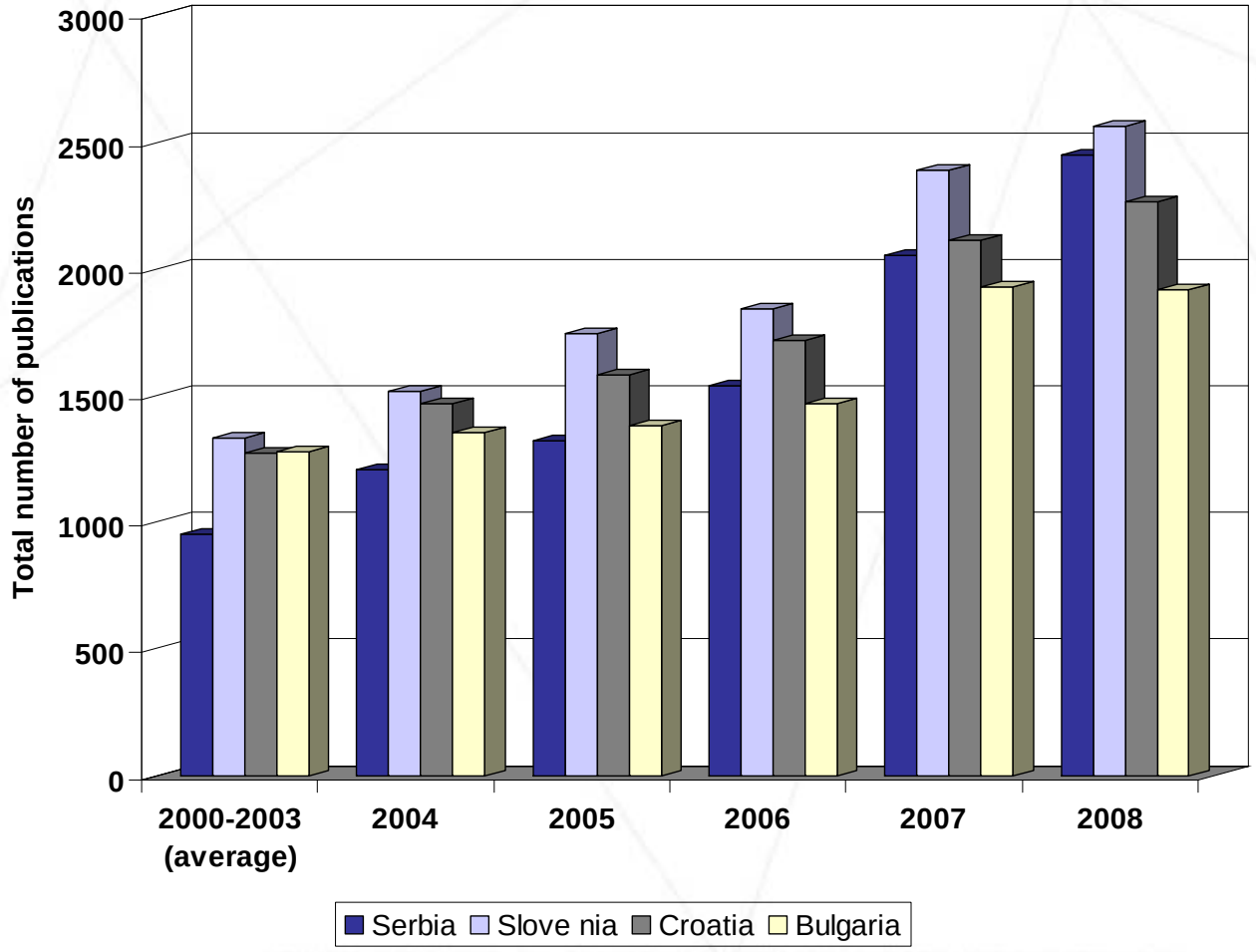
Distribution of budgetary funding for R&D (in percentages of total budget):



Source: Ministry of Science and Technological Development

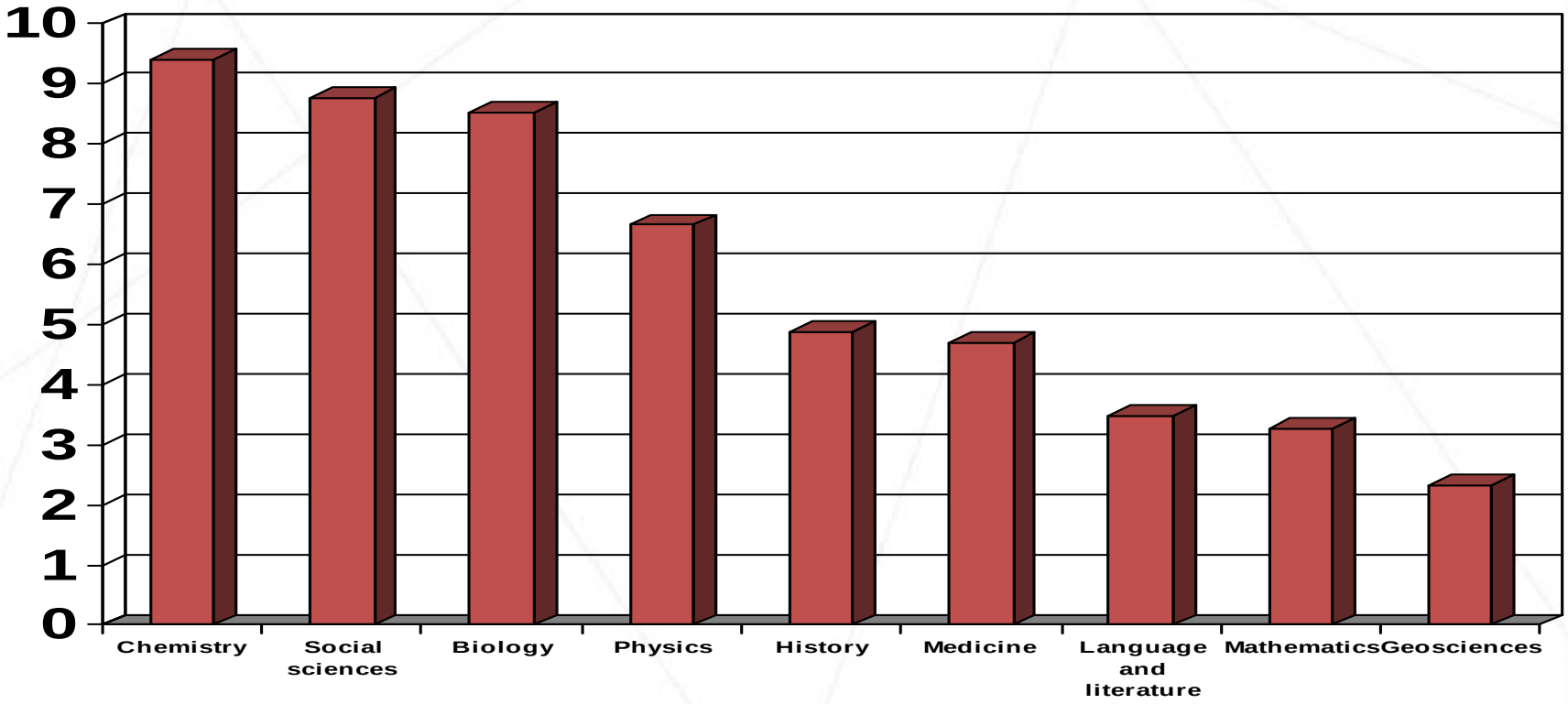
SERBIAN SCIENCE HAS REACHED NEIGHBOURING COUNTRIES IN THE NUMBER OF PUBLICATIONS

Number of publications in Serbia and countries in the region:



THERE IS NOT A SINGLE BASIC RESEARCH FIELD WHERE SERBIA INVESTS MORE THAN 10 MILLION EUROS

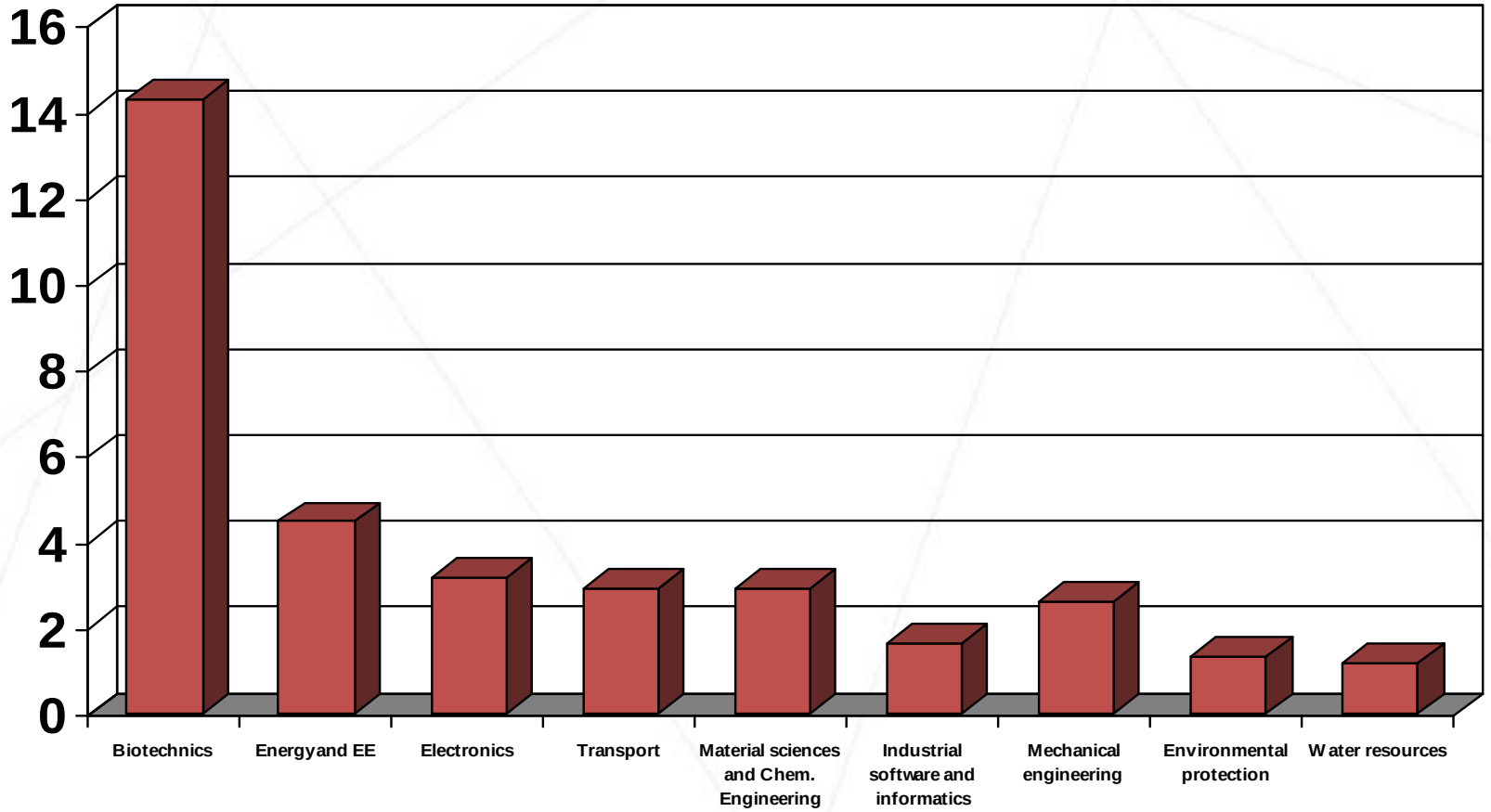
Basic research funding by discipline (in millions of Euros)



Source: Ministry of Science and Technological Development

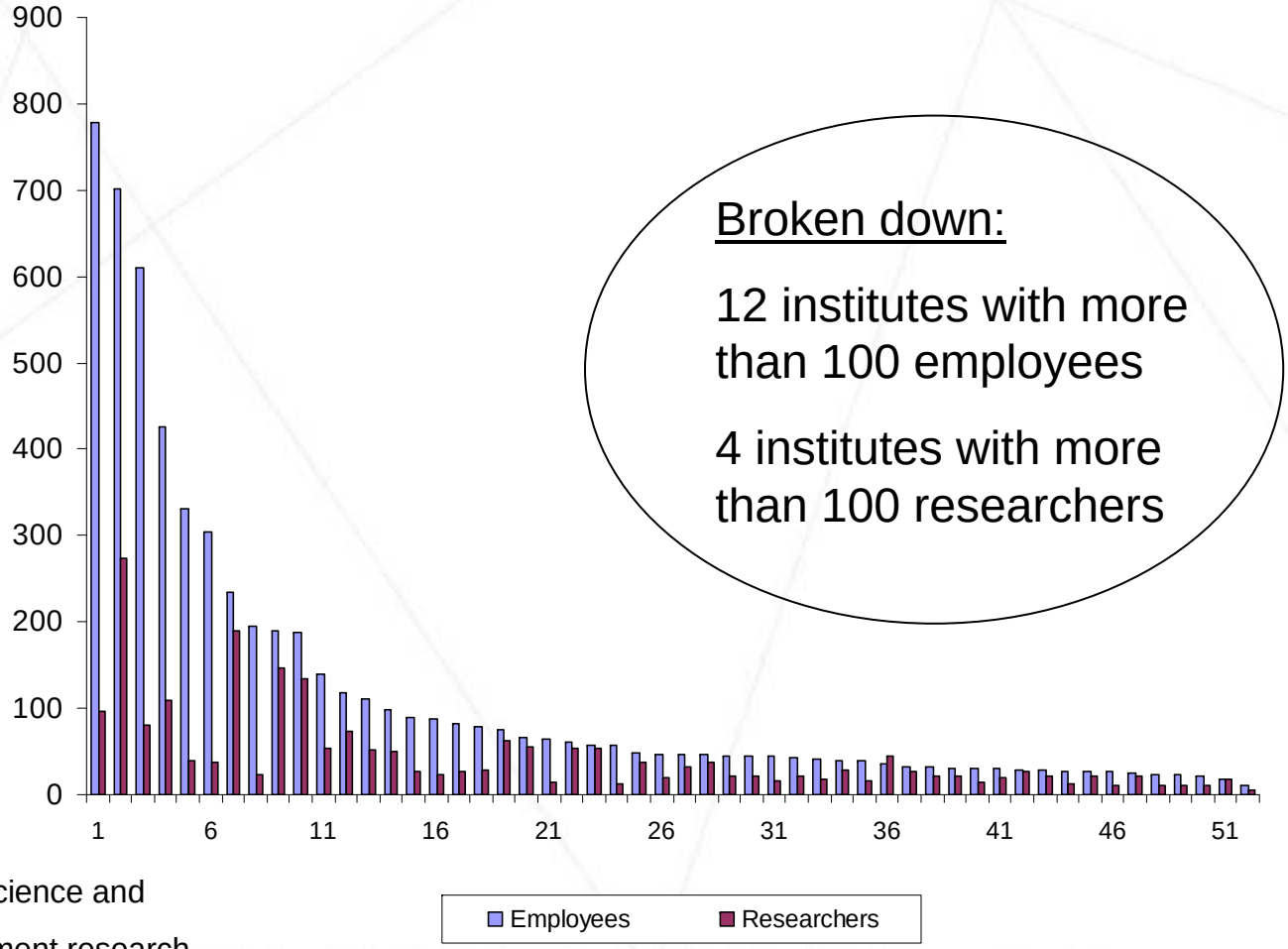
WITH THE EXCEPTION OF AGRICULTURE, THERE IS NOT A SINGLE FIELD OF APPLIED SCIENCE WHERE SERBIA INVESTS MORE THAN 4 MILLION EUROS

Technological development financing in 2008 (by research field):



Source: Ministry of Science and Technological Development

Number of employees and researchers in R&D institutes in Serbia in 2007



Broken down:

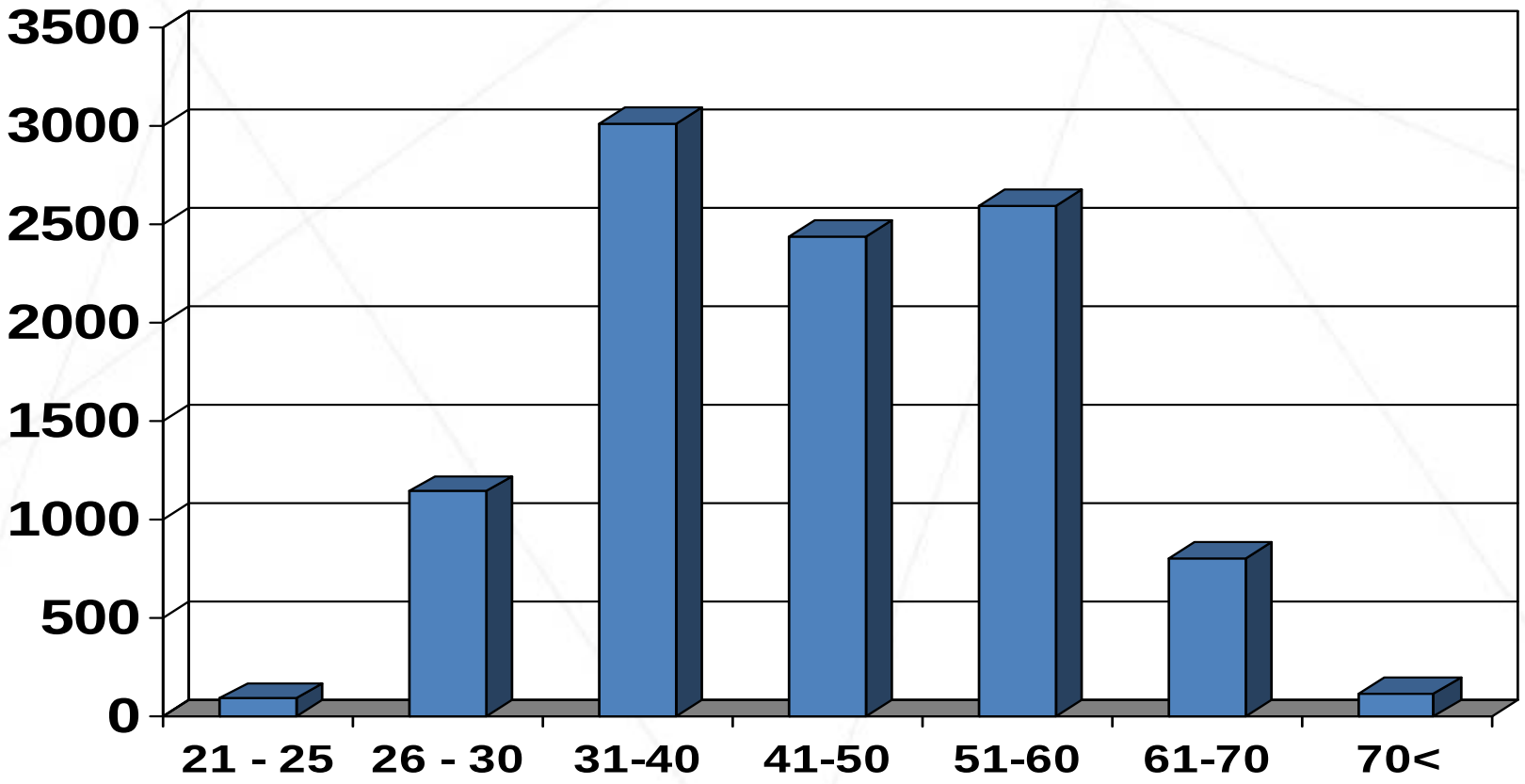
12 institutes with more than 100 employees

4 institutes with more than 100 researchers

Source: center for science and technology development research

THE AGE PYRAMID OF OUR SCIENTIFIC COMMUNITY IS WORRISOME: FEW YOUNG RESEARCHERS, MANY SOON TO RETIRE

Number of researchers in Serbia by age:



Source: Ministry of Science and Technological Development

To become relevant in science and technology and become an innovative country, Serbia needs to **FOCUS** on a few national priorities

WHILE MAINTAING CURRENT CAPACITIES, IT IS NECESSARY TO DEFINE A LIMITED SET OF NATIONAL PRIORITIES

- Criteria used for defining priorities:
  - Being in line with other national strategies
  - Possibility of successful participation in the EU 2020 agenda and alignment with EU research priorities
  - Number and quality of current human resources, in country and abroad
  - Investments so far over the past seven years
  - Success of researchers up to now
  - Amount of future investments needed to have critical mass and be relevant
  - Applicability in industry, in Serbia and abroad
  - Current international collaboration and potential for improvement
  - Multidisciplinarity
  - Importance for national agenda and affirmation of national identity

SEVEN NATIONAL PRIORITIES
IN THE FIELD OF SCIENCE AND TECHNOLOGY

- Biomedicine and human health
- New materials and nanosciences
- Environment protection and countering climate change
- Agriculture and food
- Energy and energy efficiency
- Information and communication technologies
- Improvement of decision making processes and affirmation of national identity

BIOMEDICINE (priority topics):

- Molecular base of genomic and extra genomic mechanisms induced by endogenic or exogenic factors in physiological and pathological proceses
- Environment and adaptive mechanisms
- Molecular base for transduction of hormone signals
- Biochemical and cytogenetic effects of radiation
- Biomedical engineering
- Molecular foundations of monogenic, polygenic and multi factor diseases
- Improving the quality of prediction, prevention, diagnostic and therapeutic approaches in clinical application
- Pharmacogenomics, regulatory mechanisms and pharmacological modulations
- Nutrigenomics, nutrigenetics and preventive medicine

NEW MATERIALS AND NANOSCIENCES

(priority topics):

- Ceramics and metal materials
- Composites
- Biomaterials
- Carbon nanostructures and nanocapsules
- Materials for new and renewable energy sources
- Electronic and magnetic materials
- Polymers
- Optic and photonic materials
- Eco-materials

ENVIRONMENTAL PROTECTION AND CLIMATE CHANGE (priority topics):

- New environmental protection technologies
- Integrated control of the environment (quality of water, air and soil)
- Scientific ecosystem monitoring and protection of biodiversity
- Environmental hazards and ecosystem risk assessment
- Monitoring and predicting climate change and its effects on the environment

ENERGY AND ENERGY EFFICIENCY

(priority topics):

- Increasing the efficiency of energy production, distribution and usage, with special focus on the efficiency of buildings
- Developing new technologies in the exploitation of fossil fuels
- Developing new technologies in using renewable energy sources and clean technologies with zero emission, mostly hydro-powerplants, co-generation and biomass
- Modern measuring techniques of energy usage, monitoring and optimal automatic control
- Efficient usage of current mines and research on new locations

AGRICULTURE AND FOOD (priority topics):

- New enzymes and microorganisms in bioprocesses, new products and biomass production
- Evaluation and usage of cultivated and natural genetic resources through conventional and molecular methods as a base for healthy, nutritional and safe food production
- Advancing knowledge in the field of sustainable management, production and usage of biological resources
- Developing new technologies and products in the food industry and technologies based on traditional products
- Bio-rational usage, fertility increase, remediation and protection of soil

INFORMATION AND COMMUNICATION TECHNOLOGIES (priority topics):

- Built-in electronic systems
- Intelligent sensor-actuators and multi-sensory systems
- Management and control of complex distributed systems
- Informatization and digitalization of libraries
- Telecommunication systems for digital transmission
- Radar and infrared identification and control systems
- Expert systems
- Information safety

IMPROVEMENT OF DECISION MAKING PROCESSES AND AFFIRMATION OF NATIONAL IDENTITY (priority topics):

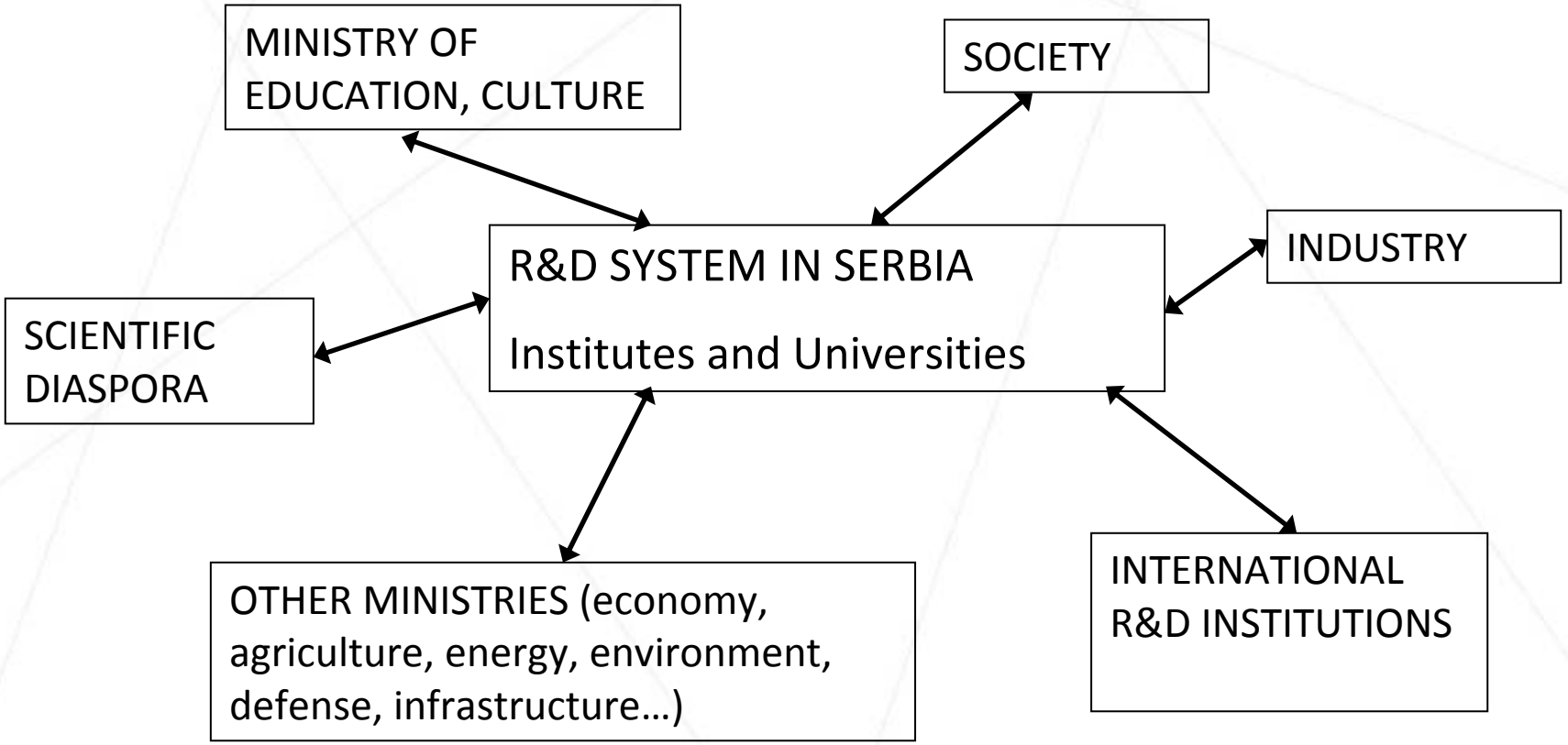
- Affirmation of the role of social sciences in formulating public policies
- Support in integrative processes: entering the EU, relations with the region, Russian Federation, USA…
- Finishing major national projects: dictionary, atlas, grammar…
- Affirmation of national historical and cultural heritage

Implementation of the Strategy through **PARTNERSHIP** and system improvement, is as important as the Strategy itself

STRATEGY IMPLEMENTATION

- Identification, development and support for talented young researchers is of crucial importance
- Higher education and science will clearly determine a mid term plan for enrollment
- Project evaluation and career development will match national priorities
- The position and results of social sciences and humanities will be improved
- The system of financing will be more flexible and will gradually reflect the national priorities
- The institution network will be rationalized in order to achieve critical mass

PARTNERSHIP



PARTNERSHIP WITHIN THE SYSTEM: CLOSE COLLABORATION OF INSTITUTES AND FACULCTIES AND REASERCHER MOBILITY

- Joint work between the Ministry of education and Ministry of Science and Technological Development on optimizing the R&D system in Serbia
- Optimal usage of equipment through mandatory cooperation of connected institutes and faculties
- Researcher mobility- easier transition from institute to faculty and reverse, and between cities as well
- Fostering collaboration through joint projects
- An integrated database of researchers, publications, projects and institutions

PARTNERSHIP WITH SOCIETY THROUGH SCIENCE PROMOTION

- New **science center** will be built in Belgrade, with activities throughout Serbia
- Valorization of researchers involvement in science promotion
- Similarly to FP7, funds will be provided in each project for result dissemination
- Closer collaboration with media
- Continuing current activities: Science Festival, science promotion and popularization project call
- Social affirmation of scientists and innovators

PARTNERSHIP WITH COMPANIES THROUGH ENCOURAGMENT OF INNOVATION DEVELOPMENT

- Two year social contribution covered for MSc. And PhD.'s employed by private sector
- Tax break for money spent by SMEs and private companies on services of the Serbian scientific community
- Creation of an early seed venture capital fund with the European Investment Fund of EIB, public money with the aim of attracting public R&D and private players
- Attraction international hi-tech companies and their R&D capacities

PARTNERSHIP WITH SCIENTIFIC DIASPORA THROUGH JOINT PROJECTS

- Finalization of data base of Serbian researchers living and working abroad
- An international refereeing system will be established using the capacity of our research Diaspora
- Possibilities will be opened up for researchers living abroad to be part of national projects
- A human resources program for the return of Serbian scientists living abroad will be conducted

PARTNERSHIP WITH INTERNATIONAL ORGANISATIONS THROUGH DEVELOPING DATABASES AND RELEVANT STATISTICAL METHODOLOGY

- Joint project with the Serbian Statistical Office to implement Eurostat and OECD reporting standards by 2012

- Joint projects and collaboration with relevant international organisations:

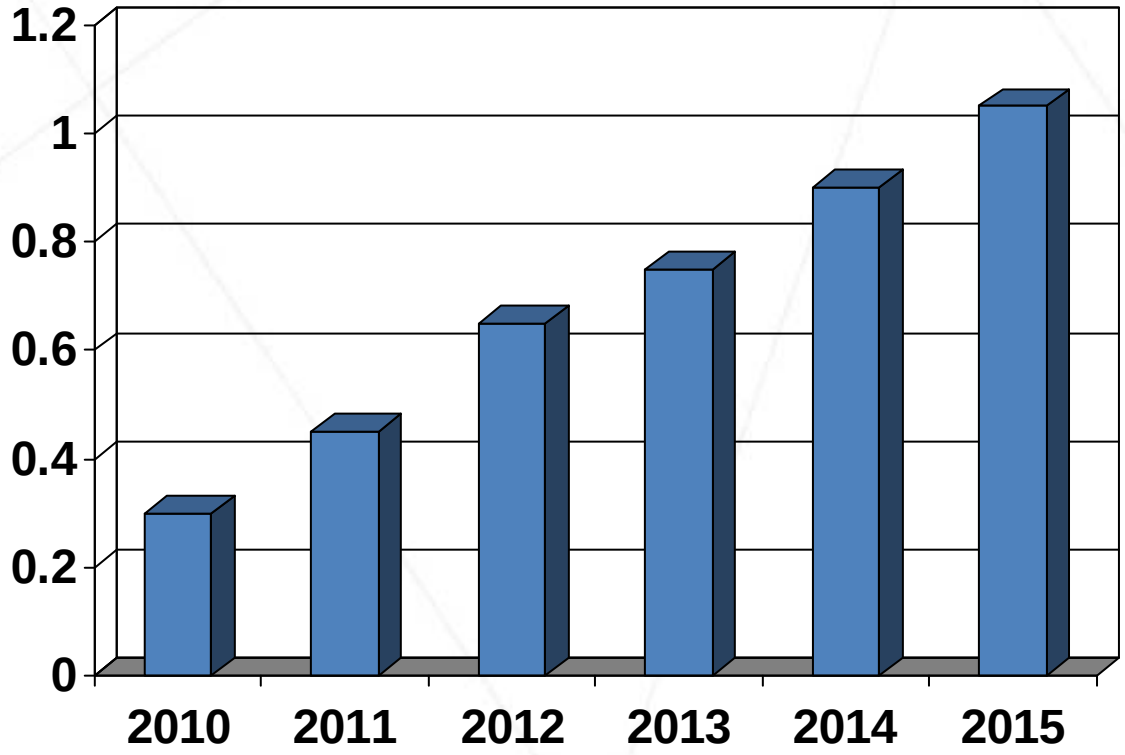
  - UNESCO
  - OECD
  - RCC
  - World bank
  - JRC...

Increasing and diversifying R&D expenditure, as well as investing 400 million euros in infrastructure, are preconditions for the success of this strategy

THE GOAL IS TO REACH TOTAL R&D EXPENDITURES OF 1% OF GDP BY 2015

(PREVIOUSLY AIMED AT IN 2007)

Expected growth of R&D expenditure over next five years:



THE SERBIAN R&D INFRASTRUCTURE INVESTMENT INITIATIVE

- Through EU grants and a joint loan with the European Investment Bank, World Bank and other international financial institutions, a total of 400 million Euros will be invested in several key infrastructure projects for science and technology in Serbia

- The project was approved in the EIB Management Committee on November 17th, 2009 and by the EIB Board of Directors on December 14th. Loan contract was signed on March 4th 2010 in Belgrade.

PROJECTS WITHIN THE INITIATIVE

1. Upgrading existing capacities (~ 70 million Euros)
   - 1.1 Adaptation of existing buildings and laboratories
   - 1.2 New capital equipment for research

2. Development of human capital (~33 million Euros)
   - 2.1 Human resources program (bringing Serbian scientists from abroad back to Serbia)
   - 2.2. Petnica Science Center
   - 2.3. Mathematical High School Campus

Future look of the
Petnica Science Center

2.4 Center for science promotion in New Belgrade

- An interactive center for science promotion aimed at children, elementary and high school students, families and the general audience

  (~10 million Euros)

Future location of center (block 39)

3. Development of centers of excellence and academic research centers (~60 million Euros)

3.1 Centers of excellence in priority research fields

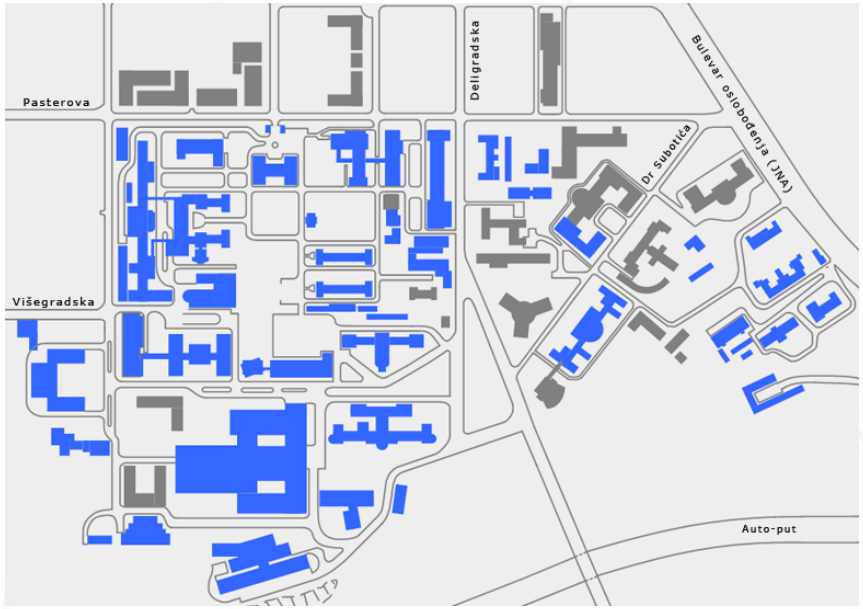
3.1.1. Energy and environment (National institute of energy and national laboratories for water, soil and air quality)

3.1.2. Material science (National Physics, Material Science and Nanotechnology Laboratory -using the current Institute of Physics infrastructure)

3.1.3. Agriculture and food (Center of excellence in Novi Sad using the capacities of the Institute for food technologies and Institute “SEME” NS)

3.1.4 Biomedical research campus in Belgrade

- This project aims to build a national biomedical research campus within the Clinical center of Serbia and adjacent to the Medical Faculty of the University of Belgrade
- This campus will unite the leading research capacity in this domain in Serbia:
  - Biological faculty (does not have a building)
  - Institute for biology research (currently lacking enough space)
  - Institute for molecular genetics and genetic engineering
  - Institute for medical research (is renting space at the Veterinary faculty)
  - Teams from other institutions in this field



Map of the clinical center of Serbia

4. Development of information and communication technology infrastructure (30 to 80 million Euros)

4.1. Campus for faculties of technical sciences in Belgrade

Option 1: Construction of new building in the courtyard between existing buildings of technical faculties

Option 2: Construction of new campus in Block 39 in New Belgrade

Option 3: Moving of Electrical engineering faculty into different existing building after adaptation

4.2. Infrastructure for supercomputing initiative “Blue Danube”

Scientific computing laboratory at the Institute of Physics

5. Creation of a knowledge based economy (~30 million Euros)

- Science and technology parks in:
  - Belgrade
  - Niš
  - Novi Sad
  - Kragujevac

Future look of the science and technology park in Novi Sad

6.1. Apartment buildings for researchers in Belgrade, Nis, Novi Sad and Kragujevac

- This project will provide non-commercial housing either for purchase of rent for young researchers:
  - Belgrade(Five more buildings in 32A)
  - Novi Sad(One building for rent and one for sale)
  - Continuation of project in Nis and first buildings for researchers in Kragujevac

One fo the two existing buildings for researchers in block 32A (New Belgrade)

WHERE WE ARE NOW AND WHAT ARE THE NEXT STEPS?

- S&T Strategy was adopted
- A new legal framework was adopted:
  - Changes to the Law on research
  - Law on innovation
  - Law on intelectual property
  - Law on Serbian Academy of Sciences and Arts
- National council for science and technology was established
- The Ministy launched on May 23rd a Call for proposals for the new 4-year project cycle in basic research, applied research (technology development) and priority research fields (multidisciplinary integrated research). The call was closed on July 15th.
- Over 800 projects were collected
- Till the end of the year: Evaluation (domestic and internatinal ones) and approval for the best ones
- As from 01 January 2011 – strategy implementation through project realization
- In parallel: the implementation unit for infrastructure investment initiative was recently established, work out on new investment initiatives, cooperation with other ministries, diaspora, international organiyations/technology companies, ...

THANK YOU
FOR YOUR ATTENTION

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