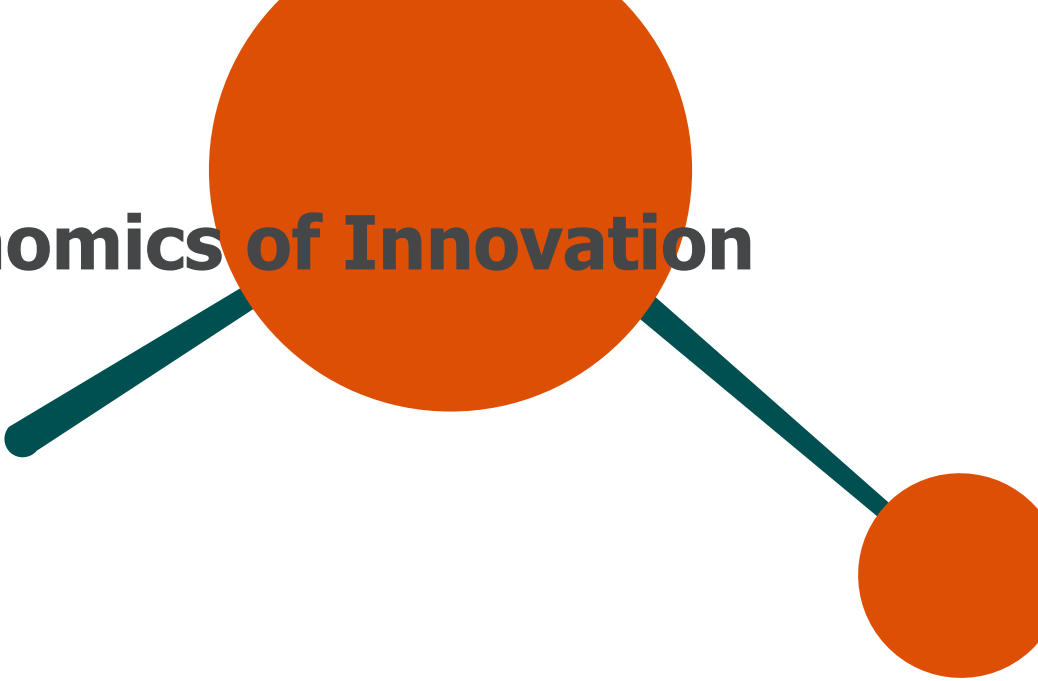
Course: Economics of Innovation



Topic: Introduction: Science, technology and innovation in the economic analysis

PhD Bobur Tursunov

S&T Structure of Uzbekistan

President of the Republic of Uzbekistan

Cabinet of Ministers of the Republic of Uzbekistan

Committee for Coordination of Science and Technology Development (CCSTD)

Sources of financing

-Funds of state budget;

- Fund of financing innovative scientific and technical activities;

-Fund of modernization and new technologies of the control economic organizations and business entities;

-Own funds of organizations;

-Grants;

-Other funds

Priorities of S&T development
State S&T programs

National and local government authorities
-Regional Centers of Innovation activities and Technology Transfer

Fundamental research programs
Applied research programs
Innovative S&T programs

Academy of Sciences;
Ministry of Health;
Ministy Higher Education;
Ministry of Agriculture and Water Resources;
Sectorial Research Institutes,
Research Institutes and Universities;
Other Ministers and Departments;

Higher Attestation Commission

Intellectual Property Agency

Center of High Technologies (CHT)

Technology Transfer Agency

Republican Fair of Innovative Ideas, Technologies and Projects

Analysis S&T flows

SUE "Scientific and Technical information"

Informational support of innovation activity
- Government;
-Business;
-Academy of Sciences;
-Ministry of Health;
-Ministy of Higher Education;
-Ministry of Agriculture and Water Resources;
-Sectorial Research Institutes;
-Research Institutes and Universities;
-Other Ministers and Departments;
-Regional Centers of Innovation Activities and Technology Transfer;
-Higher Attestation Commission;
-Technology Transfer Agency

The Legal Base of S&T and Innovation System

THE LOWS OF UZBEKISTAN

- CIVIL CODE
- on copyright and related rights
- on inventions, utility models and commercial prototypes
- on trademarks, service trademarks and appellations of product's origin
- on the legal protection of software and databases
- on breeding achievements
- on legal protection of layout geometry of integrated circuits

The Legal Base of S&T and Innovation System

THE DECREE OF THE PRESIDENT OF UZBEKISTAN

#436 of 07.08.2006
"On measures to improve the coordination and management of science and technology development"

#916 of 15.07.2008
“On measures for stimulating of introduction of the innovation projects and technologies to industry sector”

#4059 of 02.12.2008
"On establishment of free industrial zone in Navoi region»;
#4436 of 13.04.2012
"On establishment of free industrial zone Angren in Tashkent region»;
#4516 of 18.03.2013
"On establishment of free industrial zone Djizak in Sirdary region»

#1536 of 24.05.2011
“About formation of Intellectual Property Agency in the Republic of Uzbekistan”

#1631 of 26.10.2011
“About establishment of the Center of High Technologies in Tashkent”

The decision of the Cabinet of Ministers of the Republic of Uzbekistan
#228 of 15.10.2008
"On improving the activity of the State unitary enterprise "Agency for Technology Transfer"

The Legal base of S&T and Innovation system

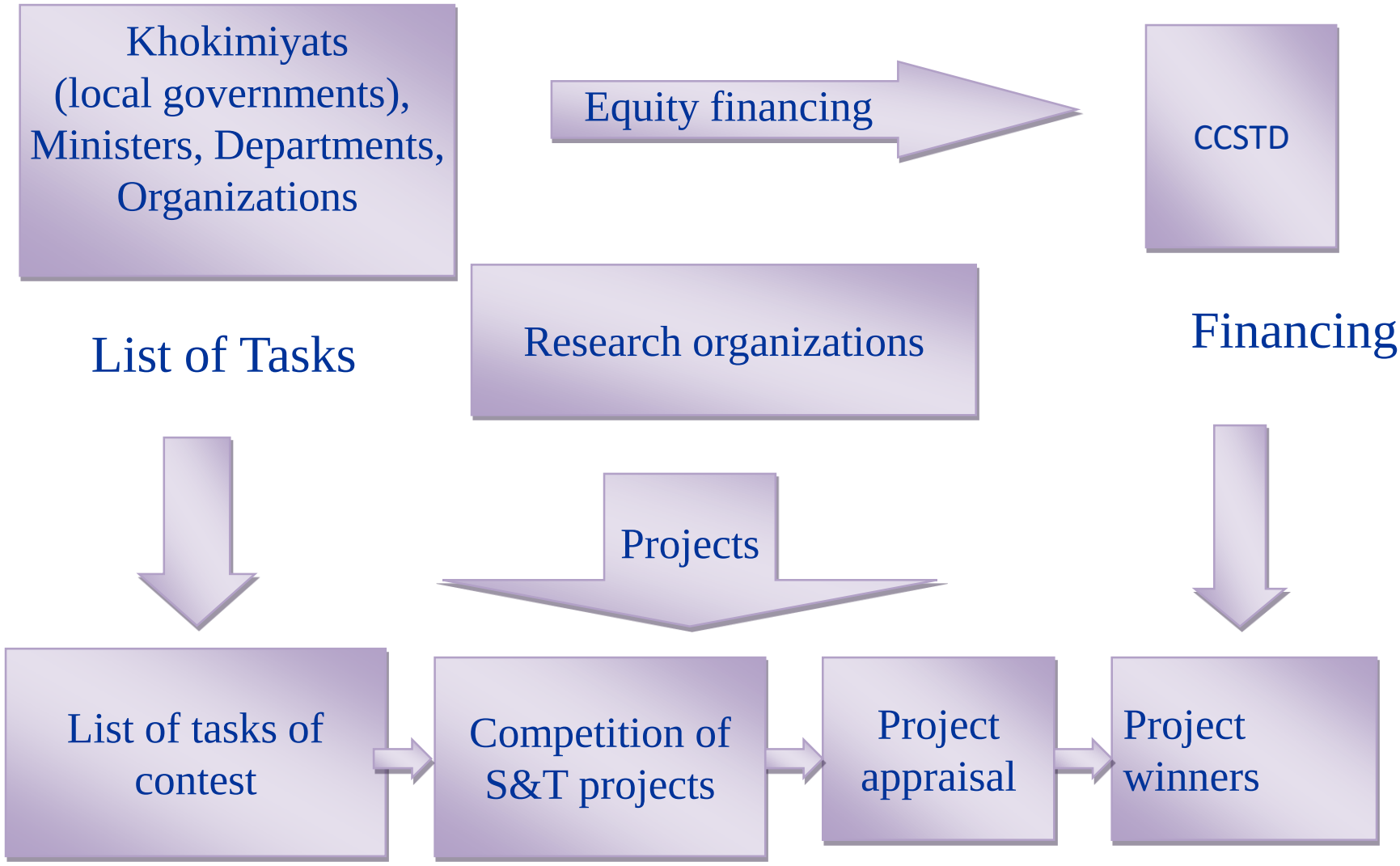
THE LOWS OF UZBEKISTAN

- The law of the Republic of Uzbekistan “On currency control”
- The law of the Republic of Uzbekistan “On foreign economic activities”
- The law of the Republic of Uzbekistan “On foreign loans”
- The law of the Republic of Uzbekistan “On free economic zones”
- The law of the Republic of Uzbekistan “On foreign investments”
- National Standard of Property Valuation #13 “Valuation of Intellectual Property”
- The law of the Republic of Uzbekistan “On the guarantees and measures of the rights of foreign investors”

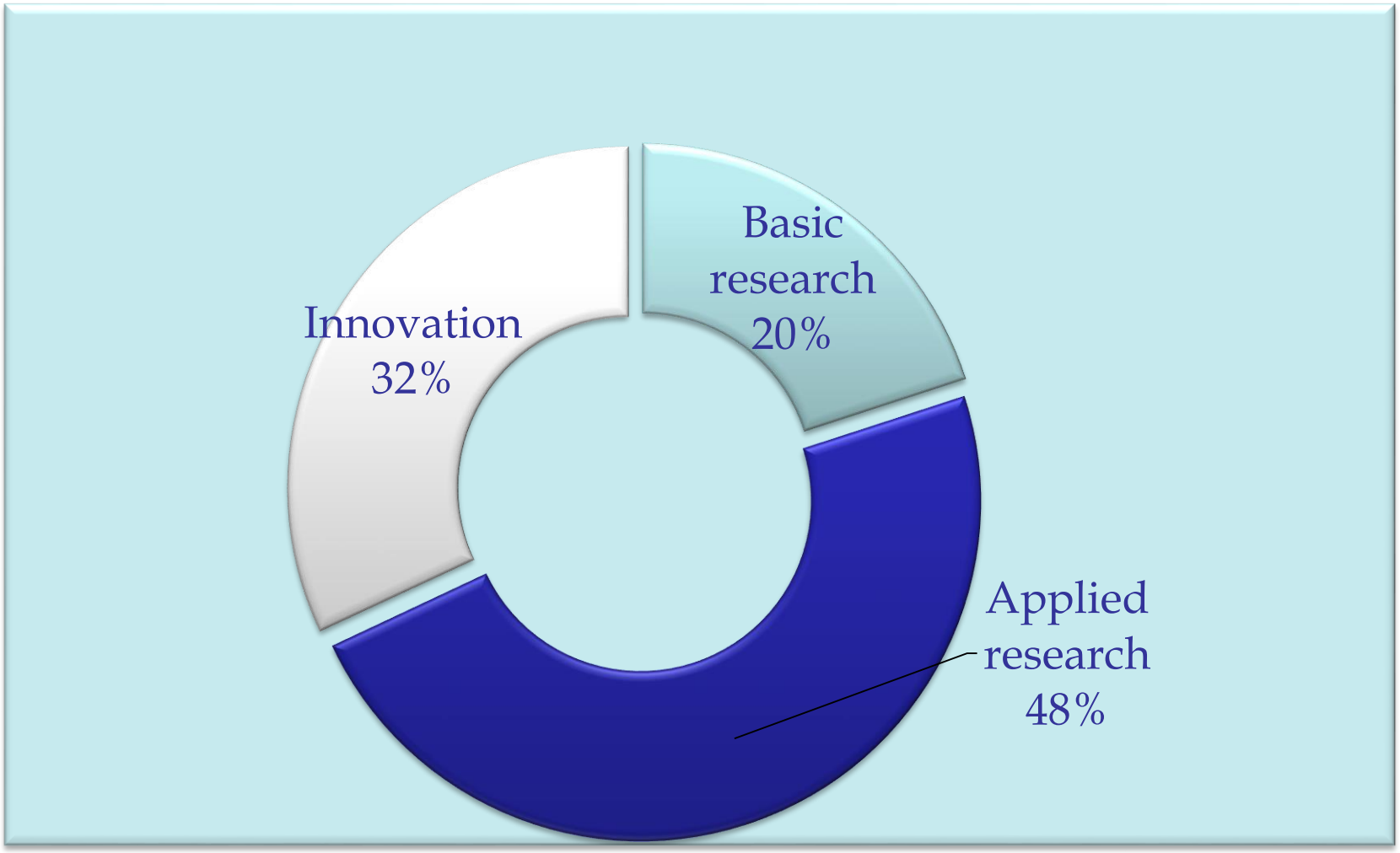
Priorities of S&T Development for 2012-2020

1. Development of democratic and legal society, constructing an innovative economy;
2. Energy, energy and resource savings;
3. Development of renewable energy usage;
4. Development of information provision and ICT;
5. Agriculture, biotechnology, ecology and environmental protection;
6. Medicine and pharmacology;
7. Chemical technologies and nanotechnologies;
8. Earth sciences (geology, geophysics, seismology and mineral materials' processing)

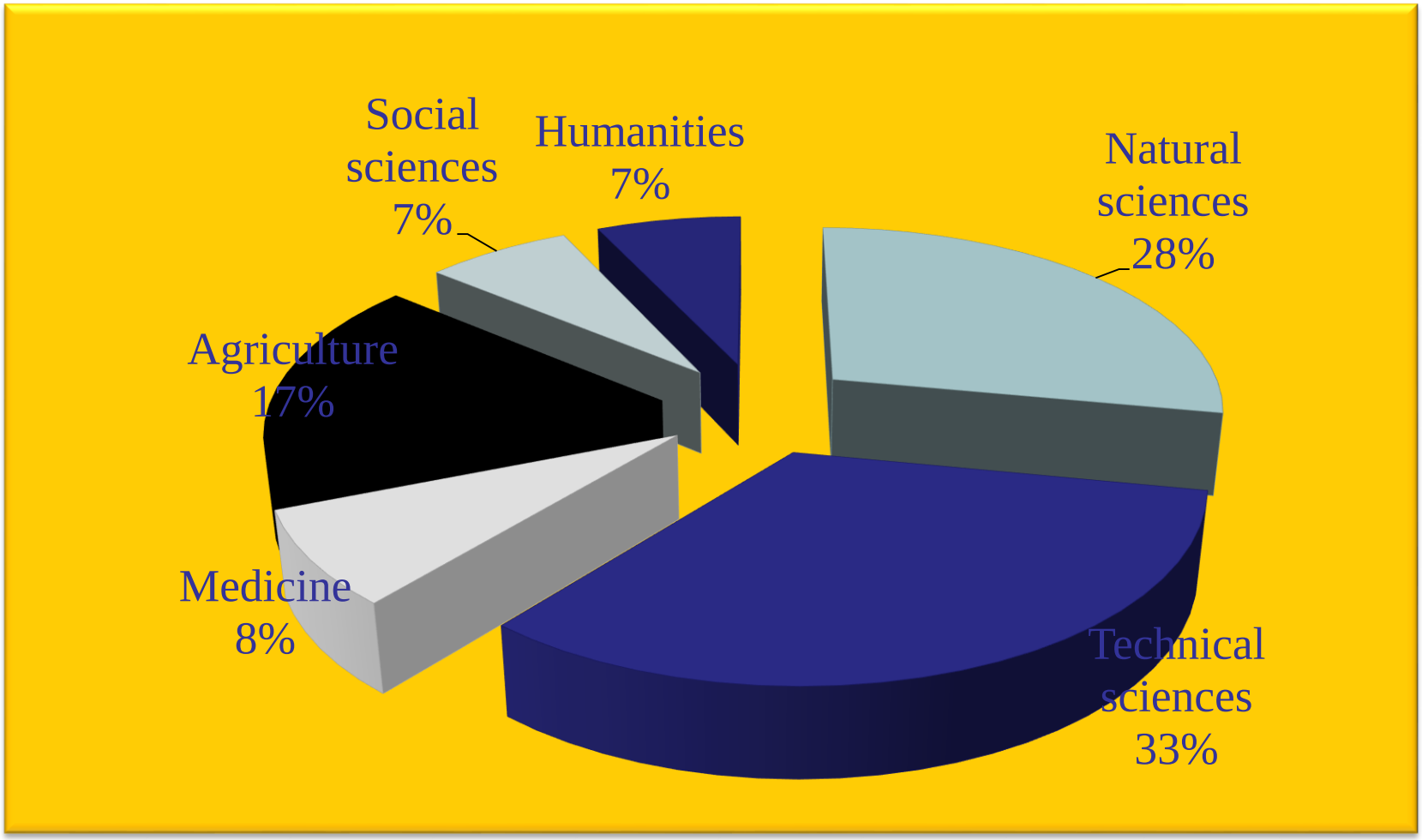
Structure of S&R System



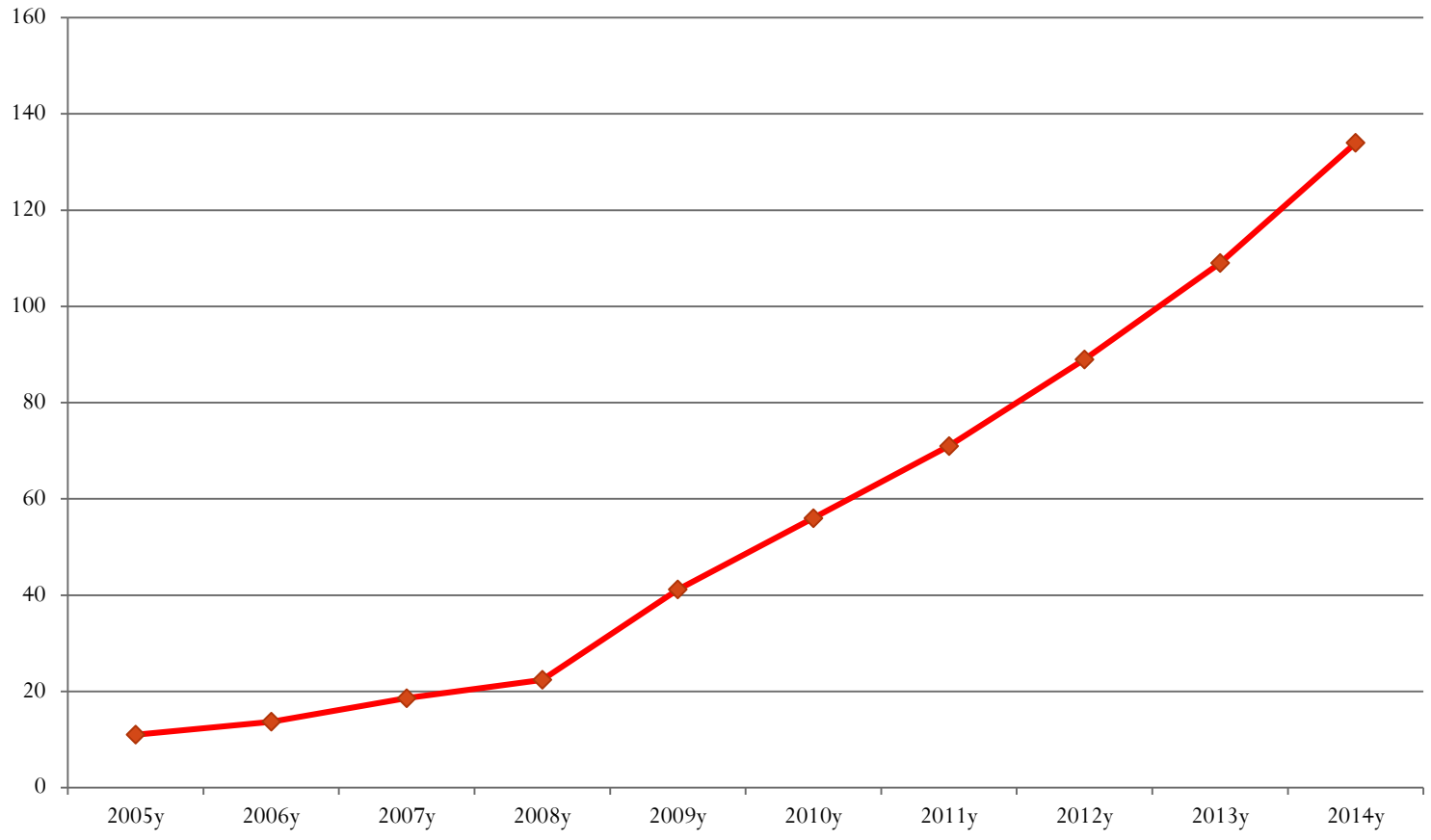
R&D funding in 2014 by science directions



R&D funding in 2014 by science areas



Dynamics of R&D Financing



Special Governmental Programs for Supporting R&D

- Governmental Programm for Scientific equipment for Research organizations (2009-2012) - $10 mln.
- Creating of the Center for Genomics and Bioinformation (2010)
- Creating International Institute for Solar Energy (2011)
- Creating Centre of High Technologies with Cambridge University (2011)

So, as part of the creation of the infrastructure of the innovation system of Uzbekistan the Educational and Experimental Centre of High Technologies (CHT) with the participation of Cambridge University was established under the Decree of the President of Uzbekistan PP-1631 dated 26th of October, 2011

Founders of CHT are Academy of Sciences of the Republic of Uzbekistan and Ministry of High and Secondary Education of the Republic of Uzbekistan

Principal Objectives of CHT:

- support the innovative development of science and technologies in Uzbekistan by bridging the gap between business and science, and by pioneering the highest standards of applied scientific research and innovation practice;

- provide training for young professionals to create an innovative infrastructure, analytical and technical services, enabling environment for the introduction of new designs, materials and technologies;

NEW BUILDING OF CHT

To realize above mentioned plans there is constructed new building of CHT possessing modern infrastructure.

Reconstruction of the building of CHT has been lasted for 3 years. It is planned to be launched in 2015. Total area of the building is 6500 sq. m

Examples of Scientific Equipments:

X - Ray

SEM

ICP-MS

High Pressure reactor

Spray Dryer

GC-MS

HPLC

FT-IR

MiSeq DNA Sequencer

Real Time PCR

Over the organization period we reached to purchase more then 170 modern equipments which are intended to do a research in Biology, Chemistry, Geology and Geophysics, Biochemistry and Biophysics and Physics.

CHT operates by following areas:

1. Chemistry
2. Biology
3. Physics
4. Biophysics and Biochemistry
5. Geology and Geophysics

Objectives of CHT in the area of innovation activity:

- **Creating and maintaining a dense stream of scientific research and objects of intellectual property;**
- **Creating the proper conditions for the concentration of "critical mass" of scientists (the so-called "scientific cluster") from different fields of natural sciences, ensuring their mutual integration in order to develop competitive technology or scientific product**

Innovative activity of CHT:

Fundamental science creates new knowledge, which is methodological base of new technologies

Applied science creates new technologies which have commercial value on the technologies market

Innovative project is a process of creation and market launch of innovative product

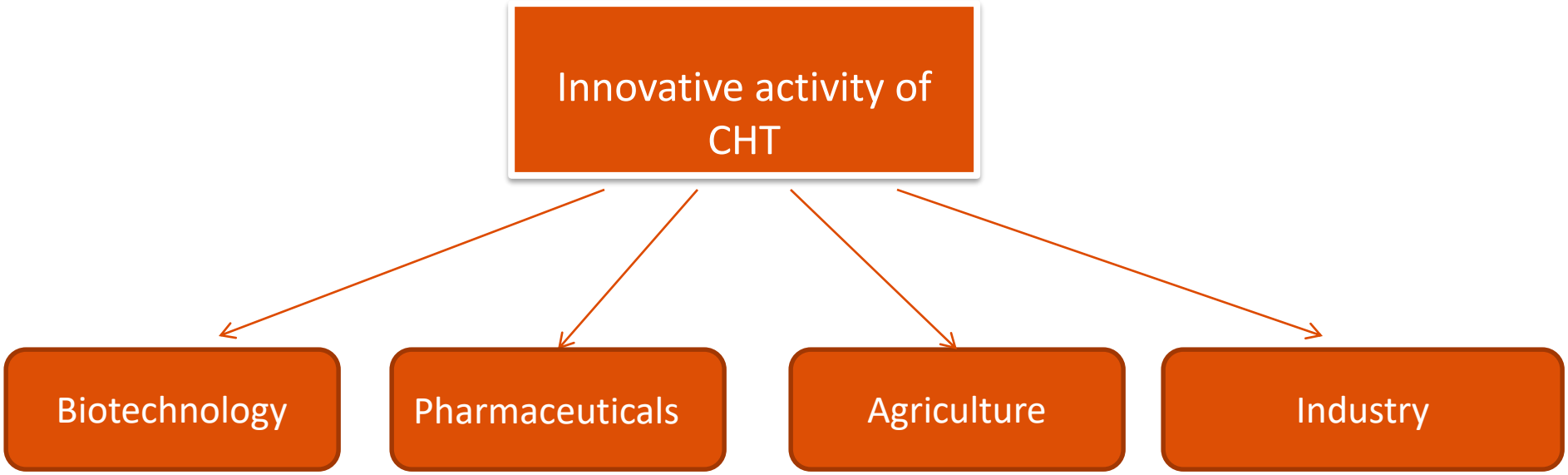
To conduct successful business innovation CHT provides the following services:

Conducting applied R&D on the scientific activities of the Centre on the basis of demand and orders from both domestic and foreign enterprises and organizations.

Transfer technologies developed both in CHT and other scientific groups to the industry of Uzbekistan (patenting, licensing and etc.)

Creating and supporting high-tech start-ups by providing the equipment and infrastructure, consultancy in finding investment capital, marketing

Holding training courses, open lectures, seminars and webinars on current topics of modern science, technology and innovation management with the participation of professors from Cambridge University for young professionals and academics and research institutions and the other interested parties



1. The production of enzyme preparations
2. The use of industrial microorganisms
3.Preparation of recombinant proteins

1. Manufacture of pharmaceutical preparations
2. The manufacture of diagnostic test systems
3. Production of bioactive additives

1. The production of insecticides
2. Procurement of elite seeds / crops
3. Fertilizers

1. The production of chemical components
2. Manufacture of food additives
3.Anti-corrosion agents
4.Anerobically technology
5. Geodynamics, Mineralogy, identification of new composite materials

Education and Training Activity:

- More then 120 listeners and specialists from different organisations improved their qualifications by appropriate topics;
- About 150 listeners have participated in our topic specific courses;
- During 2012 - 2014 study period 16 bachelors and 21 master thesis's were prepared;
- 21 papers were published.

Objectives:

- ✓ To improve scientific infrastructure
- ✓ To encourage and support high standard scientific research
- ✓ To encourage the implementation of ongoing S, T & I activities in universities, R&D institutions and companies
- ✓ To reverse the domestic weakness in technology-intensive segments
- ✓ To increase the productivity and competitiveness of Brazilian companies
- ✓ To support the entry of innovative companies into global markets
- ✓ To stimulate private investments in innovation

Finep – Priorities

Support for: ***Research Infrastructure, Tech. Services and Innovative Environment***

Defense and Aerospace

Information and Communication Technologies (ICTs)

Renewable Energies

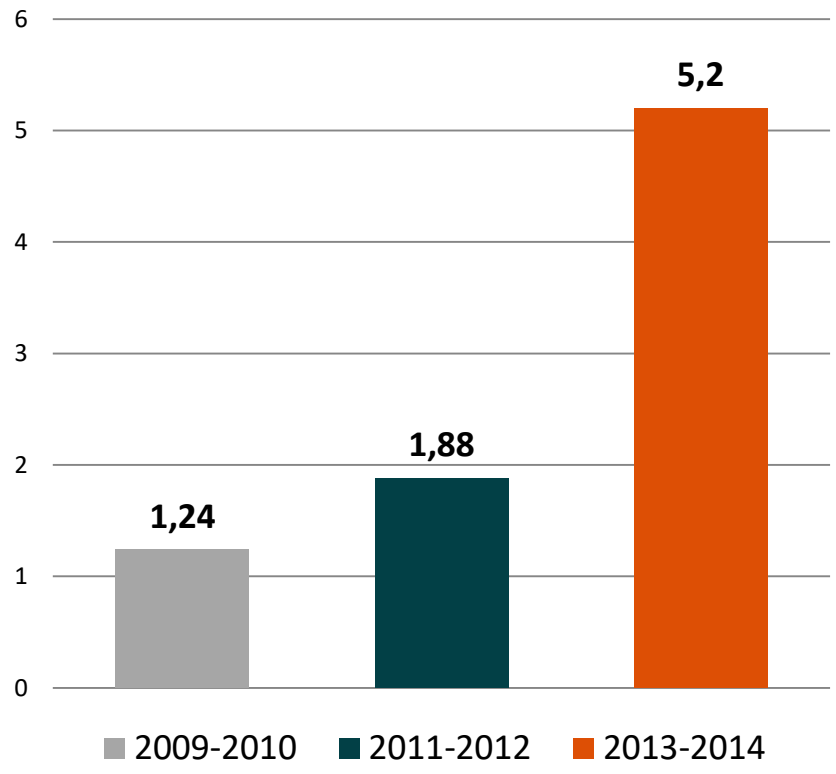
Oil & Gas and Marine

Health

Clean Tech

Social Development and Assistive Technologies

Loans for Companies



US$ 5,2 billion in 2013-2014:
4 x 2009-2010

52% of contracts
2009-2010 to 2013-2014

62% new clients (2013-2014)

Grants – Research Infrastructure

Expand and modernize research infrastructure in universities and research institutes in Brazil

Period: 2007 a 2013

	Quantity	Amount (USD million)
Calls for proposals	9	840,0
Proposals	1.153	2.407,7
Financed projects	719	839,8
Construction	399.576 m²	255,9
Equipments	7.135	401,6

Grants - Innovative Environment

Technology parks and incubators program

Promote habitats to support innovation and knowledge intensive business

- Call for projects (2010): 12 projects / USD 26 million
-
- Call for projects (2013): 16 projects / USD 44 million

- TOTAL: 28 projects / USD 70 million

Investment

Stimulate the creation and development of innovation based business and help them gain access to capital.

Actions:

- Identify and develop entrepreneurs and support them in approaching with investors (Seed Forum, Venture Forum and Forum Brasil: 42 editions / 377 participants / 77 invested companies)
- Select and invest in Seed Capital, Venture Capital and Private Equity Funds focused on innovative companies
- Equity for high tech companies

Investment - Funds

Focused on Venture Capital, Private Equity and Seed Capital Funds

- 281 Received Proposals
- 132 GP's
- 126 performed due diligences
- 29 Funds: USD 208 million committed Finep

  USD 4,4 billion Fund Capital

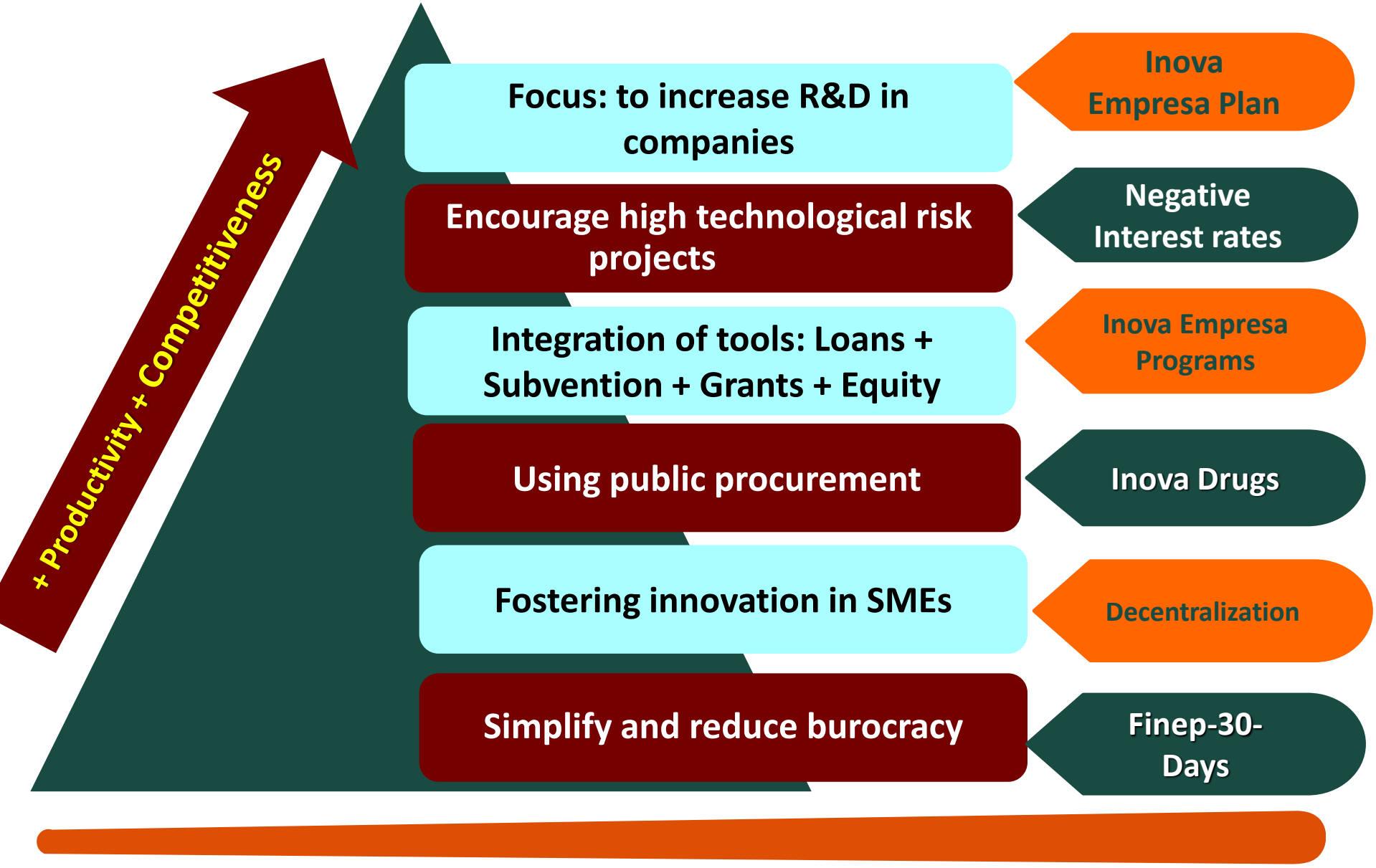
8,4 x

- 120 Invested Companies
- 18 investors take part on program board
- 12 observers in the last call

Equity - Investment in Companies

- Focus: Stimulate business growth by investing in technological innovation projects in companies that have condition to achieve leadership positions in their markets
- Capital: USD 200 million
- National coverage
- Sectors: ICT, Health, Biotech, ...
- 2014: 2 invested companies

Inova Empresa Plan



Clean Energy and Green Economy Programs

INOVA ENERGIA

Encourages research activities, development, engineering, technology absorption, production and marketing of products and processes for innovative services in the field of energy.

Inova Sustentabilidade

Supports innovations that induce sustainability in Brazil, such as technologies and solutions for sustainable production, recovery of biomes and also supports initiatives for sustainable productive forest-based activities, environmental sanitation and disaster prevention.

Measuring Innovation

- Measuring innovation = effectiviness of public policies / organization of new policies and plans / transparency and information to society.
- Brazil economic = develop public policies for fostering innovation.
- After 2000 - Measuring the effort on technological innovation / statistics every three years.
- Focus on R&D expenditure, R&D dynamic and strategy within firms, factors that influence the innovative behavior of firms, incentives, barriers and outcomes of innovation.
- Relevant growth on the amount of innovative firms (2000 – 2011)
- Innovative firms: higher output, productivity and salary, better skilled workers, export more and are able to compete world wide.
- Reported factors that obstruct firms innovation: high risk and cost, rigid firm organization, lack of skilled personnal, short technology and market data, low opportunities for open innovation, standard rules, low consumers perception to innovative products, lack of technical services.

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