

International Conference
Better Policies for More Innovation
Assessment – Implementation – Monitoring

**Innovations in Kazakhstan: Status and Directions
for the Future Development**

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Minsk, Belarus

17- 18 November 2015

Content:

- 1. Basic indicators of innovation development in Kazakhstan**
- 2. Planning, Implementation and Evaluation of STI policy**
- 3. Mechanisms for the improvement of Industry – science cooperation**
- 4. Improvement of legislative base in the field of entrepreneurship development and support of commercialization**

1. Basic indicators of innovation development in Kazakhstan

Global Innovation Index 2015

TOP PERFORMERS PER REGION*

NORTHERN AMERICA



- 1 USA
- 2 Canada

LATIN AMERICA & THE CARIBBEAN



- 1 Chile
- 2 Costa Rica
- 3 Mexico

EUROPE



- 1 Switzerland
- 2 UK
- 3 Sweden

NORTHERN AFRICA & WESTERN ASIA



- 1 Israel
- 2 Cyprus
- 3 Saudi Arabia

CENTRAL & SOUTHERN ASIA



- 1 India
- 2 Kazakhstan
- 3 Sri Lanka

SUB-SAHARAN AFRICA



- 1 Mauritius
- 2 South Africa
- 3 Senegal

SOUTH EAST ASIA & OCEANIA

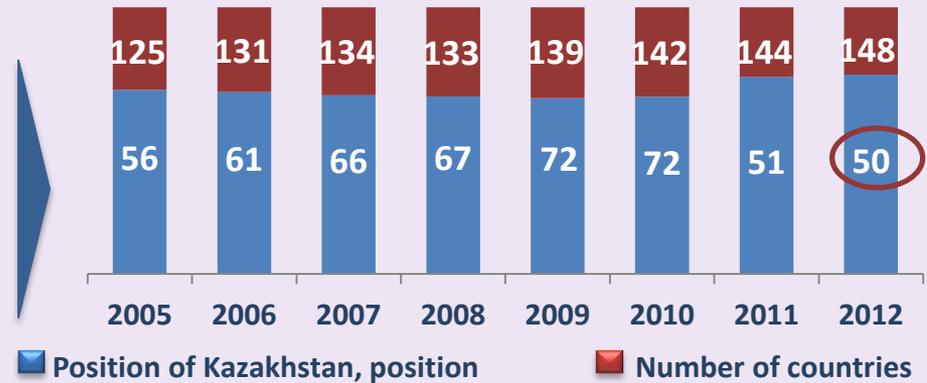


- 1 Singapore
- 2 Hong Kong (China)
- 3 Republic of Korea

*Excluding countries with high numbers of missing data points

Ranking of Kazakhstan in GIC WEF

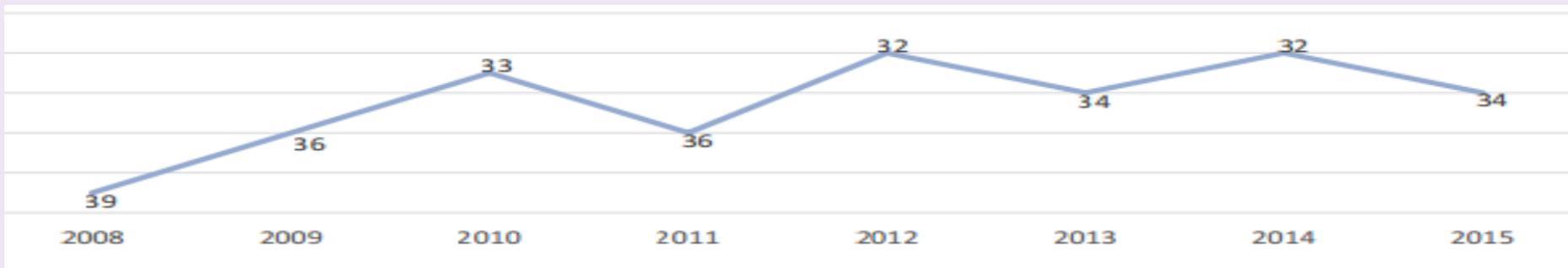
Dynamic of development of position of Kazakhstan in condition of annual extension of number of examined countries



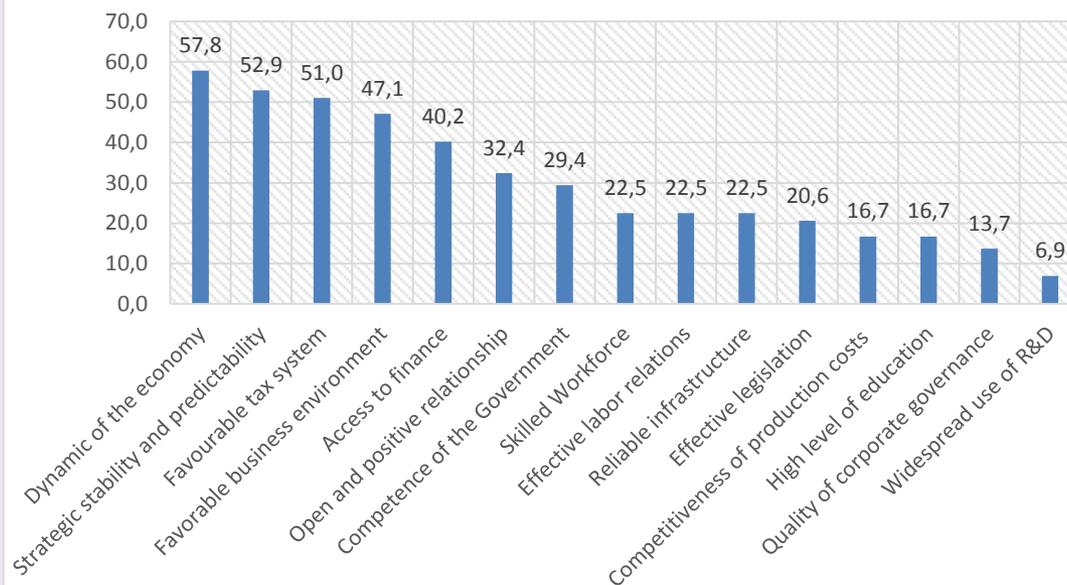
50 position among 148 countries

Sub-indexes on innovations and technologies	2011-12	2012-13	2013-14
Access to venture capital	92 ↓	105 ↓	72 ↑
Access to technologies	103 ↓	90 ↑	88 ↑
Adaptation of technologies by companies	113 ↓	91 ↑	78 ↑
Innovation potential	101 ↓	92 ↑	74 ↑
Quality of research institutes	121 ↓	108 ↑	102 ↑
R&D Expenditures of companies	107 ↓	94 ↑	77 ↑
Cooperation between industry and academia in R&D	119 ↓	90 ↑	79 ↑
State procurements of high-tech products	93 ↓	71 ↑	58 ↑
Access to scientists and engineers	106 ↓	104 ↑	98 ↑

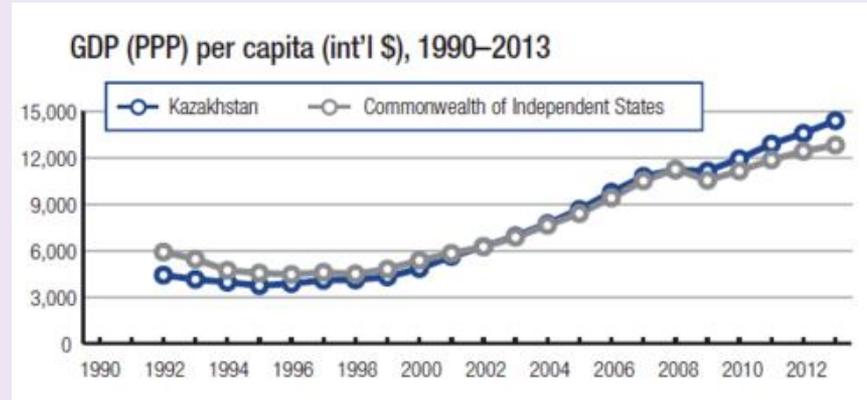
World Competitiveness Ranking by International Institute for Management Development



**The most attractive factors of the Kazakhstani economy
in 2015 (%)**



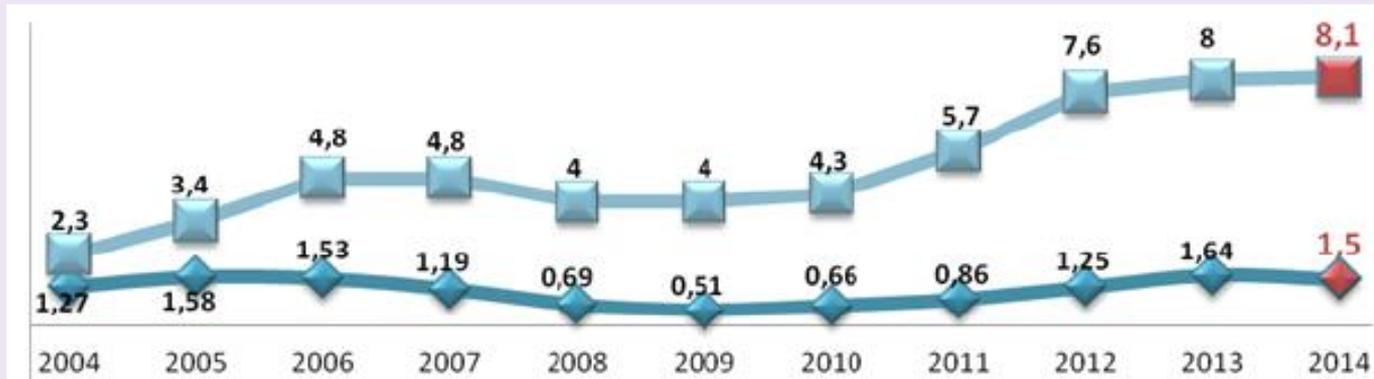
Basic R&D indicators



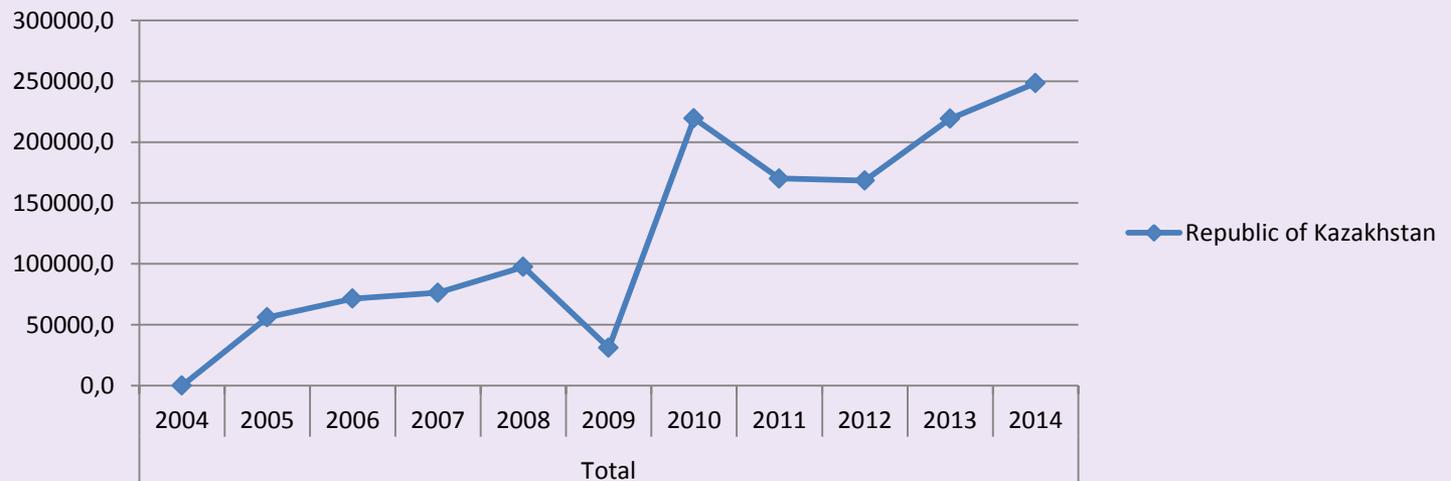
R&D expenditure (% GDP)

Source: OECD, Main Science and Technology Indicators Database, 2013

Share of innovative enterprises and innovative products in GDP (%)



Expenses on technological innovations in the industry



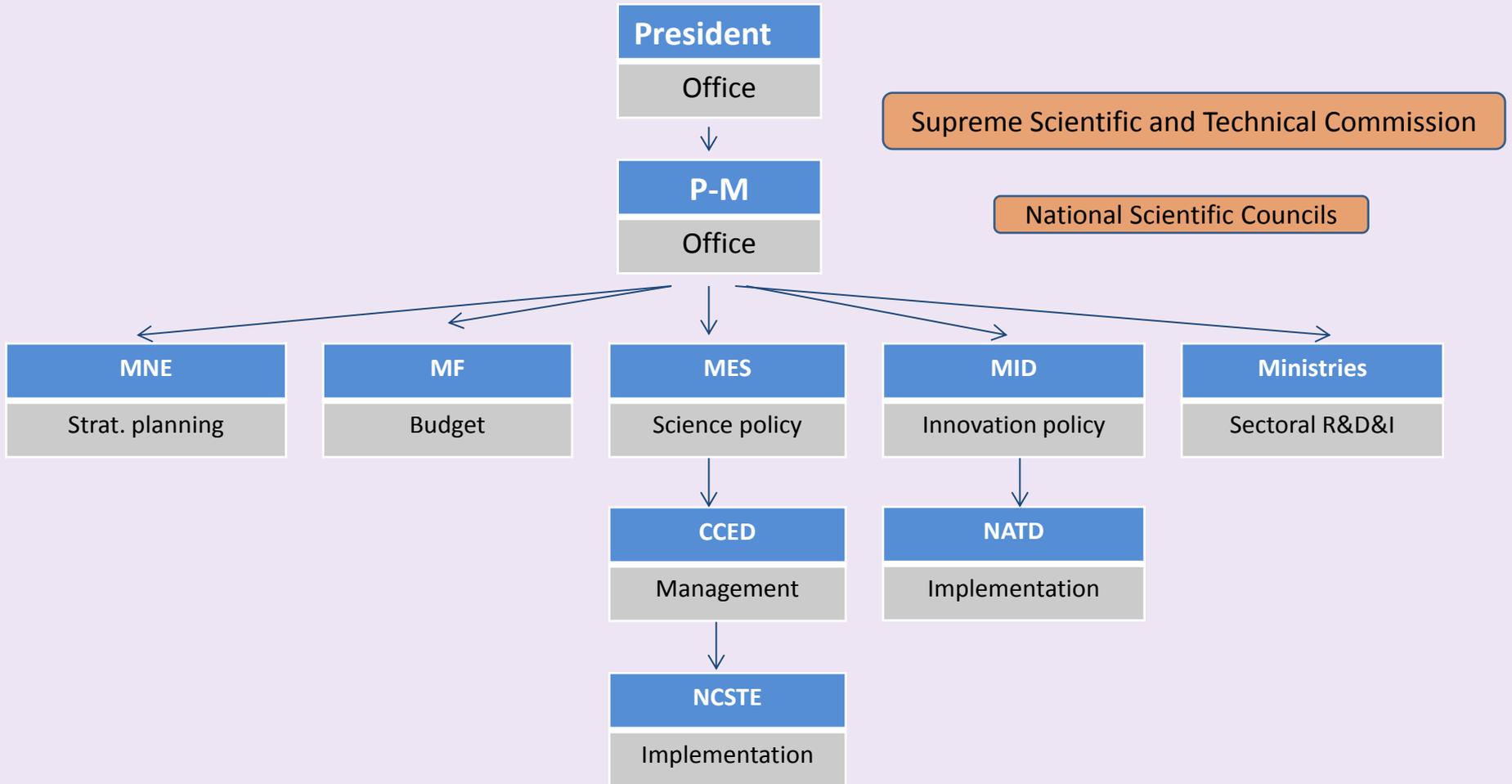
2. Planning, Implementation and Evaluation of STI policy

INNOVATION PERFORMANCE REVIEW OF KAZAKHSTAN, 2012

The Review suggests a number of initiatives to improve the coherence of innovation policies, developing the possibilities opened by recent legal changes. In particular, it stresses the ***need to align strategic objectives with the results of foresight programs and other priority-setting mechanisms and to facilitate the coordination of actions by different organizations*** during the design and implementation phases at different levels.

At the same time, ***the bottom-up flow of information and ideas and their integration into innovation initiatives***, through a consultation process, should be encouraged.

R&D&I System Governance Structure – MACRO Level



MNE – Min. of National Economy
MIF – Min. of Finance
MES – Min. of Education and Science
MINT – Min. of Investments and Development

CCED – Committee on Control in the area of Education and Science
NCSTE – National Center of State Science and Technology Evaluation
NATD – National Agency for Technological Development

National R&D management system

Supreme Science and Technology Commission

Ministry of Education and Science

**National
Scientific Council
«Energy and
Machinery
Engineering»**

**National
Scientific
Council «Rational
use of natural
resources,
processing of raw
materials and
products»**

**National
Scientific Council
«Information and
telecommunicati
on technologies»**

**National
Scientific Council
«Life Science»**

**National
Scientific Council
«Intellectual
potential of the
country»**

National Center of State Science and Technology Evaluation



Priority areas for State R&D Funding (Ministry of Education and Science)

Rational use of natural resources, processing of raw materials and products

Applied research:

1. Technology and techniques for mineral resource base and water resources replenishment;
2. Minerals development technologies;
3. Raw materials and products processing technologies;
4. New materials production technologies;
5. Ecological and environmental management problems.

Basic research:

1. Theoretical bases of complex hydrocarbon processing and environmental management;
2. Fundamental research in the field of raw materials and production processing;
3. Environmental management and sustainable environment in Kazakhstan;
4. Fundamental problems of materials science;
5. Theoretical fundamentals of multi-functional materials and coatings with the specified set of properties.

Energy and Mechanical engineering

Applied research:

1. Renewable and alternative energy sources and energy use of industrial and household wastes;
2. Heat and electric power industry and energy-efficient technologies;
3. Nuclear and hydrogen energy;
4. Energy sector impact on the environment;
5. Energy and automotive engineering;
6. Agricultural and food machinery;
7. Oil and gas engineering;
8. Mining engineering;
9. Mechanical engineering, automation and robotics.

Basic research:

1. Fundamental research in the field of energetics and mechanical engineering.

Information and communication technologies

Applied research:

1. Information technologies;
2. Communication systems and technologies;
3. Intellectual systems and technologies;
4. Program and technological complexes and systems;
5. Geoinformation systems and technologies;
6. Intellectual robotics systems;
7. Modern information technologies in scientific and educational processes.

Basic research:

1. Fundamental research in the field of information and communication technologies;
2. Theoretical basis of mathematical modeling of technological processes.

Life sciences

Applied research:

1. New technologies to address the problems of aging and prolongation of human life;
2. Molecular, biochemical and cellular bases of living systems;
3. Scientific basis for improving the productivity and sustainability of plants and animals;
4. New biological products for medicine, agriculture;
5. Biomedicine and genetic engineering development.

Basic research:

1. Fundamental research in the field of chemistry and biology.

Intellectual potential of the state

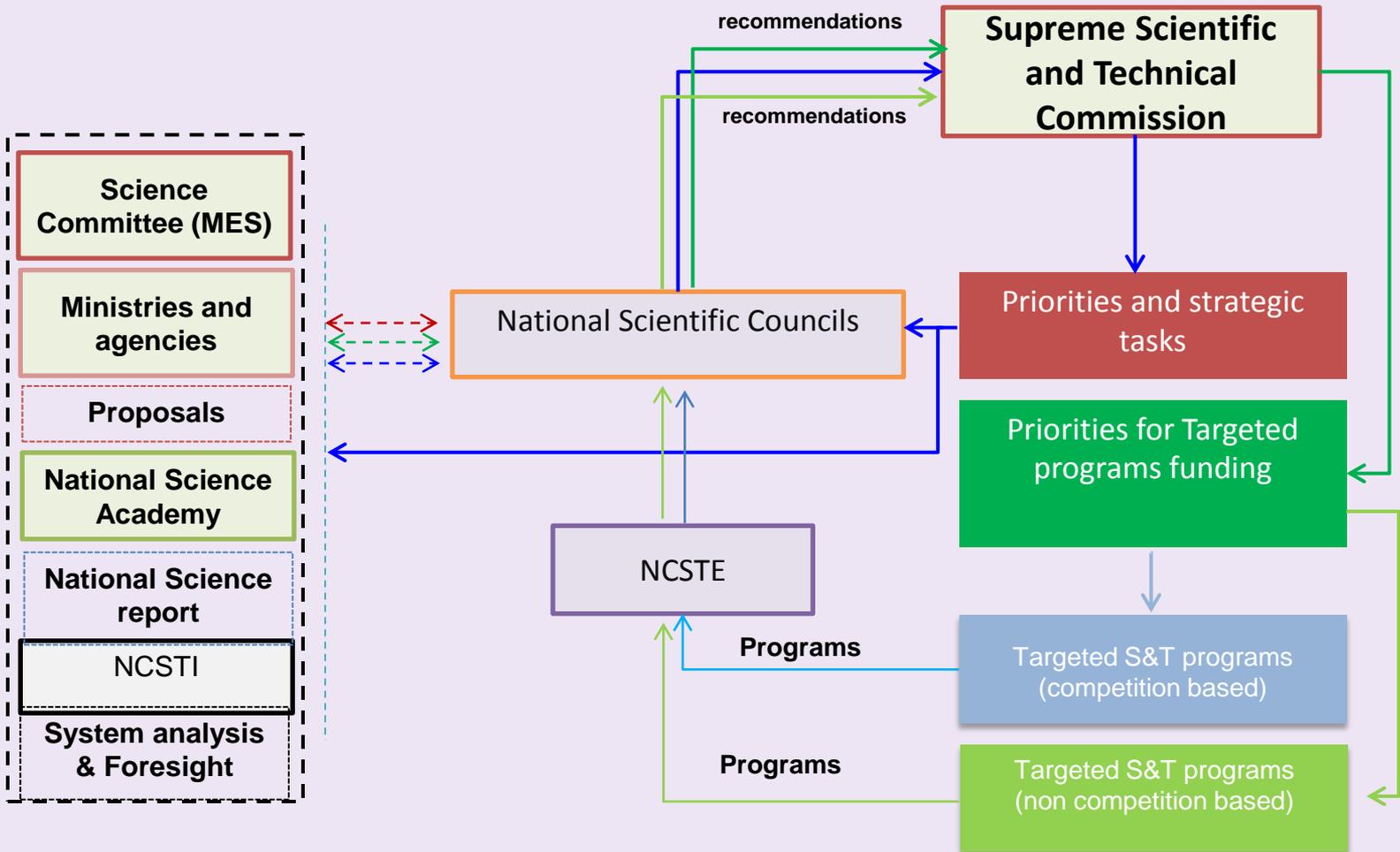
Applied research :

1. Study of the socio-economic conditions of high competitive production (economies) development;
2. Research on the implementation of social and economic policy of the state in modern conditions;
3. Actual problems of social science and humanities and interdisciplinary studies.

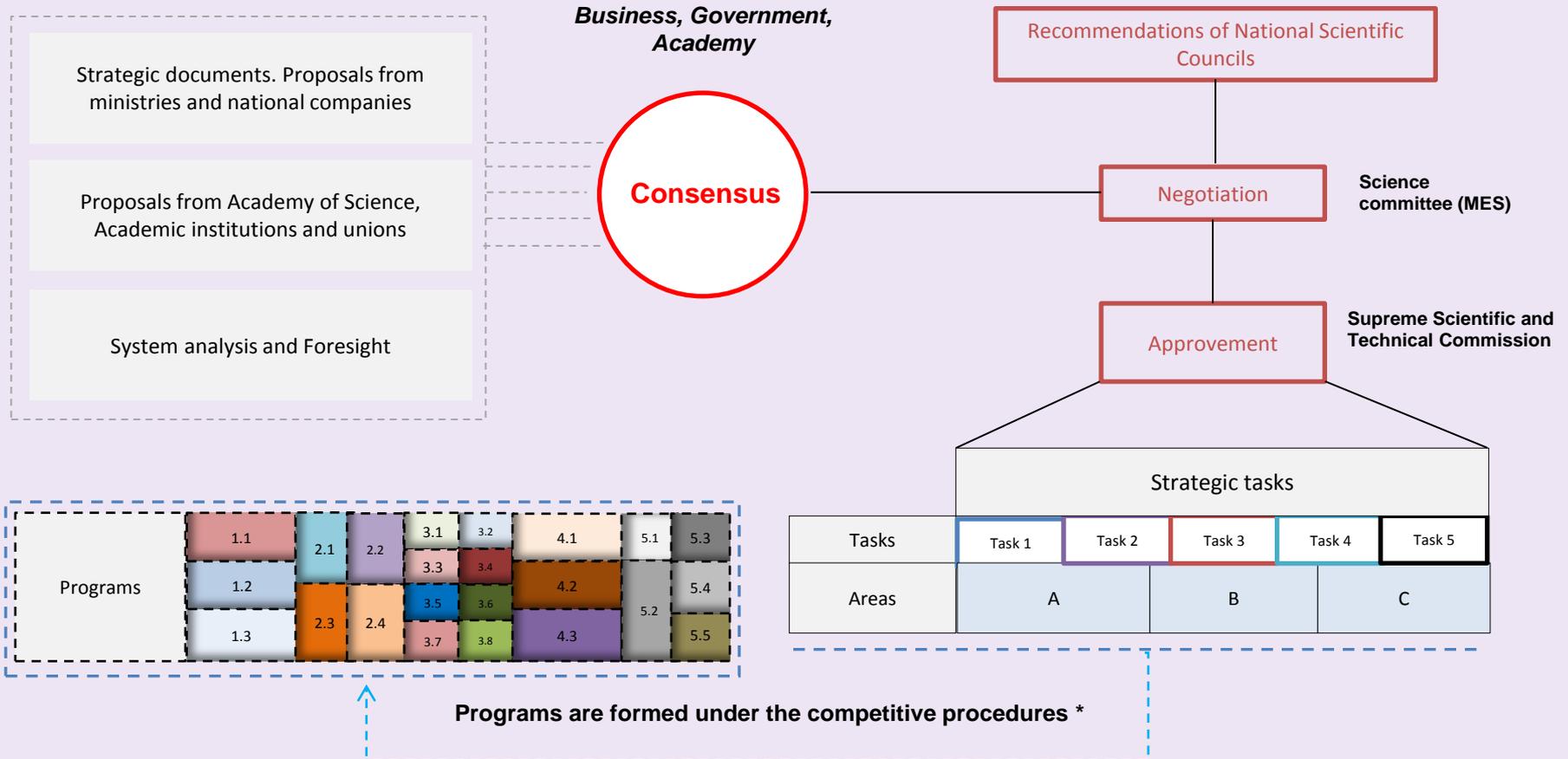
Basic research:

1. Fundamental research in the field of mathematics, mechanics, physics;

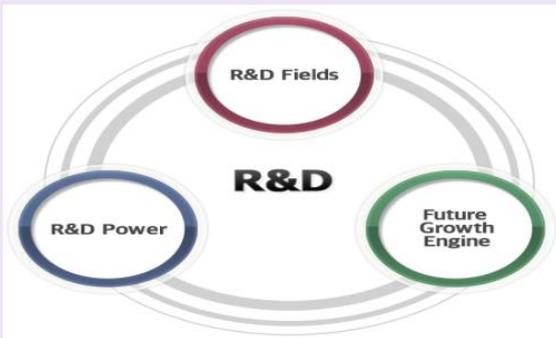
Process of National R&D priorities identification



Process of National R&D priorities identification



System Analysis and S&T Foresight (2013 - 2014, NCSTE)



Expert Panels, Patent & Bibliometric Analysis, Scenario Planning, Technology Competence Analysis

List of R&D Programs and Projects, TRMs

Links between Science, Academy, Industry and Government

Links between R&D Policies on Ministerial Level

Implementation of P.I.E. System



System Analysis and S&T Foresight (2013 - 2014, NCSTE)



PRESERVATION AND GAIN
IN HEALTH AND LIFE QUALITY
OF A NATION



ENERGY EFFICIENCY
AND CONSERVATION
SOCIETY



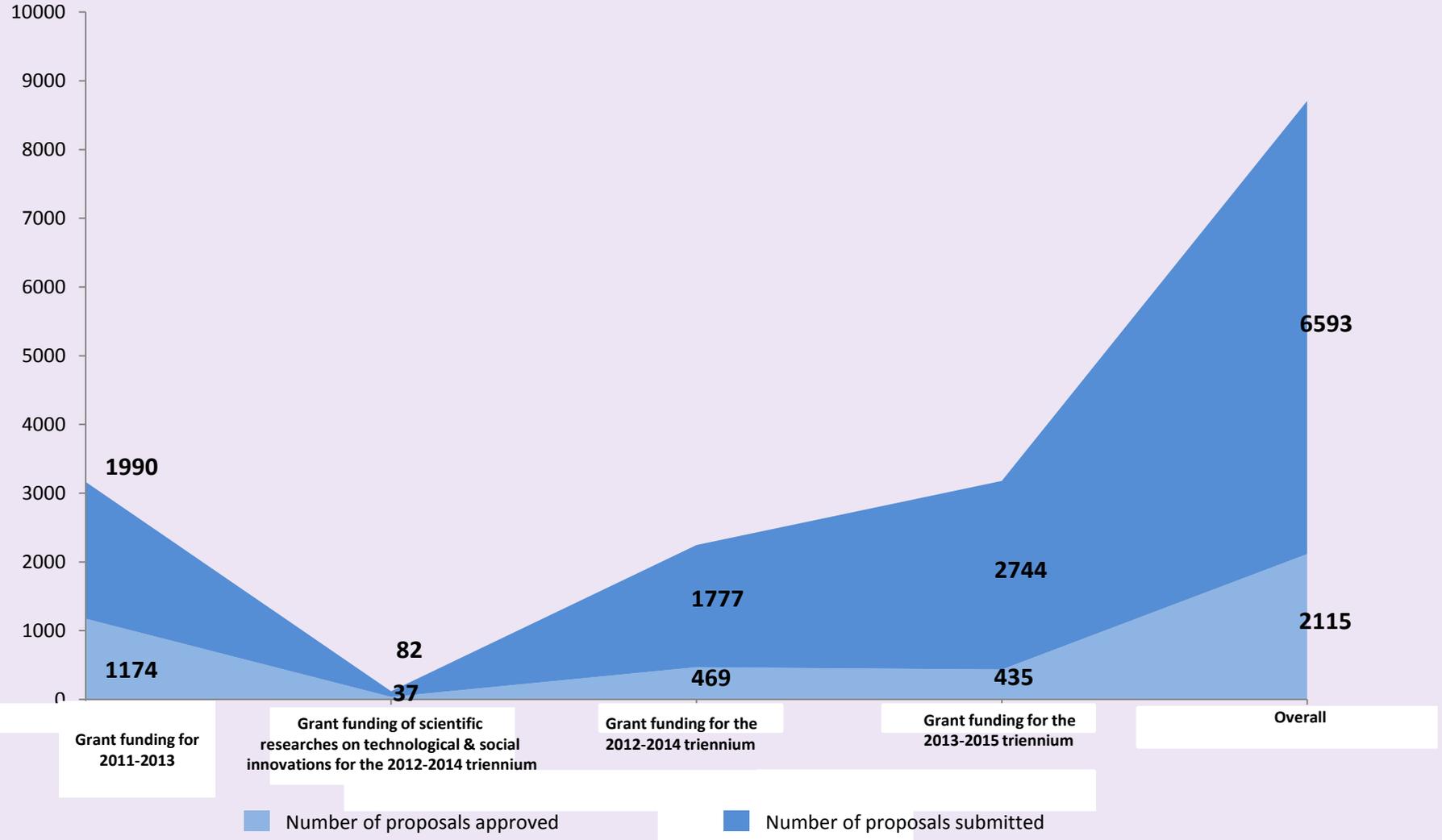
ECO-FRIENDLY AGRICULTURAL
PRODUCTS, WHICH PROVIDE
PRESERVATION AND IMPROVEMENT



ECOLOGICALLY CLEAN
ENVIRONMENT ON THE BASIS
OF GREEN TECHNOLOGIES

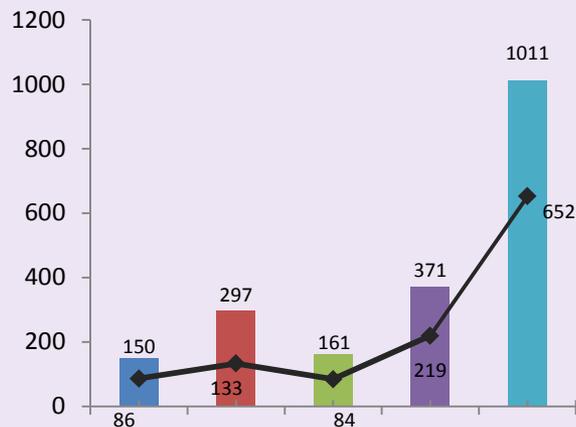


Grant proposals applied and approved

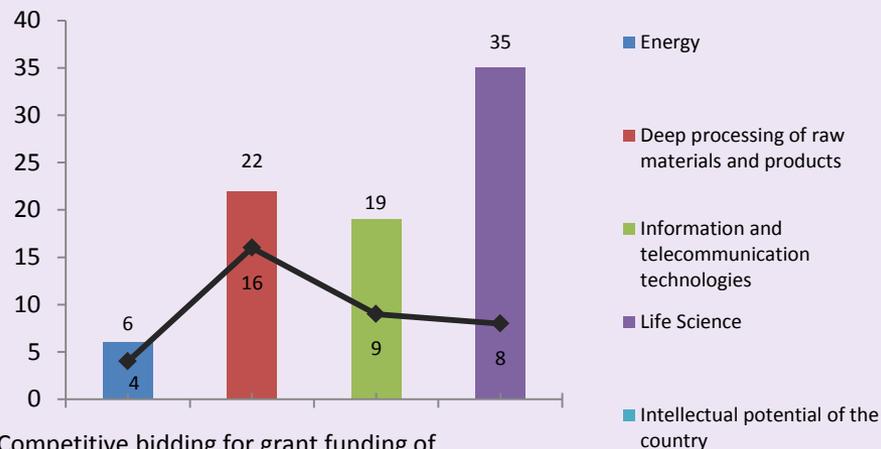


Grant proposals within priority fields

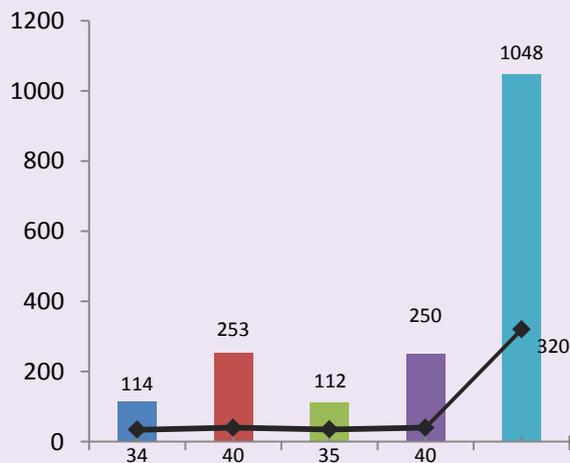
Competitive bidding for grant funding of scientific researches for the 2011-2013 triennium



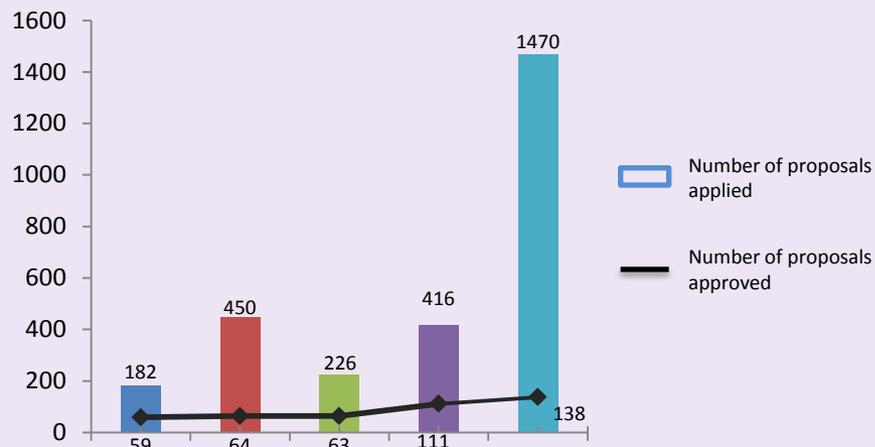
Competitive bidding for grant funding of scientific researches on technological & social innovations for the 2012-2014 triennium



Competitive bidding for grant funding of scientific researches for the 2012-2014 triennium



Competitive bidding for grant funding of scientific researches for the 2013-2015 triennium

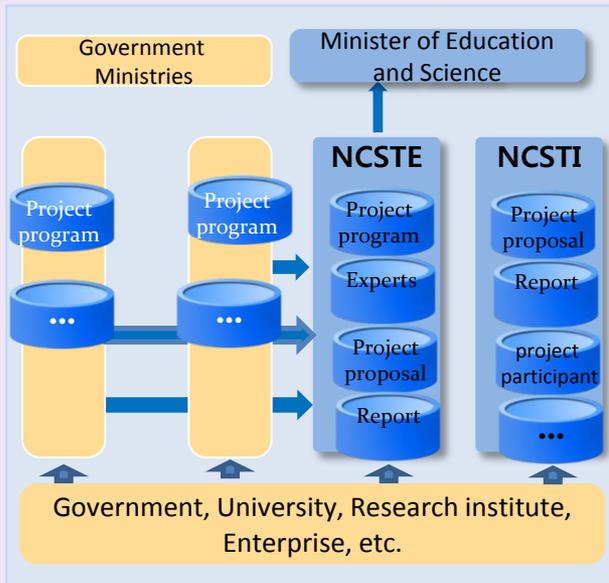


The Review stresses the ***importance of a regular evaluation of innovation support programs and proposes the compilation of a complete database of financed projects, incorporating a selection of indicators that allows for a quantitative analysis of the effects of the promotion programs and the characteristics of the awarding process.*** The need to take into account the special characteristics of innovation should be emphasized in measures of performance to prevent excessive risk avoidance. Returns from public investments in innovative projects should be assessed on a portfolio basis rather than focusing on the performance of each individual project.

National Information Platform (under the designing in collaboration with KISTI)

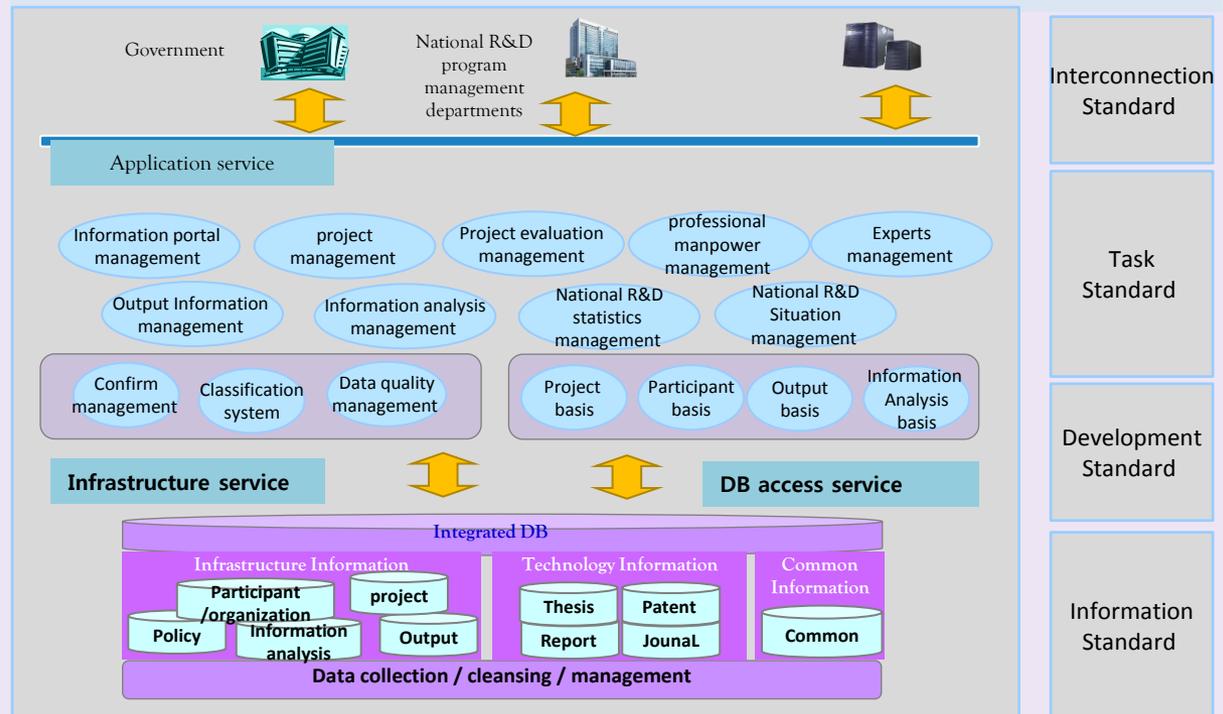
As-Is

Services for evaluation, experts, outcome information



To-Be

A service platform for integrated services



- Improvement : National R&D program and project management for Information distribution integrated Platform(Information Standardization, Information connection , Data filtering, etc.)
- Effect : National R&D program and project information integrated Platform construct and Information application

3. Mechanisms for the improvement of Industry – science cooperation

The Review proposes an **industry-science linkages** (ISL) mapping and evaluation exercise to identify bottlenecks and barriers, in particular concerning the interaction of actors from different institutional sectors and their motivations, and to raise the attractiveness to private entities of participating in government financed projects or cooperation arrangements.

It is advised that the scope of horizontal policies and instruments should be widened at the expense of the narrowing of vertical ones. This would include horizontal policy instruments that specifically target ISL, such as the planned technology platforms, and the modification of existing ones to include eligibility criteria related to ISL activities.

Recommendation 6.1

Public funding of applied research should seek to encourage a commercial orientation. *In order to achieve this, authorities should consider the measures:*

- Requesting the introduction of a statement describing the commercial potential of the research seeking financing;*
- Giving higher priority to proposals that also receive funding by commercial companies,*** *in line with the proposed conversion of innovation grants into a matching funds instrument;*
- Strengthening the links between publicly-financed R&D organizations and companies,*** *providing mechanisms that allow technology to be tested against market needs as it is being developed;*
- Engaging business interests in decisions related to R&D through the creation of science-industry groups*** *covering different priority areas, through the planned introduction of technology platforms and other instruments;*
- Supporting the creation of technology transfer offices in research organizations and strengthening existing office; and*
- Further development of the infrastructure necessary for the generation of scientific knowledge, the provision of training and the commercialization of technology.*

Development of National Innovation System in Kazakhstan

2003 - 2009

2010 - 2014

2015 - 2019

	2003 - 2009	2010 - 2014	2015 - 2019
Legal basis and programs	<ul style="list-style-type: none"> ➤ Law «About state support of innovation activity» ➤ The first strategy for industrial-innovation development until 2015 ➤ Program on establishment of National Innovation System for 2005-2015 . 	<ul style="list-style-type: none"> ➤ Law «About state support of industrial innovation activities» ➤ Law «About innovation cluster «Park of innovation technologies» ➤ State Program of Accelerated Industrial Innovation Development 2010-2014 ➤ Conception of Innovation Development of Kazakhstan until 2020 	<ul style="list-style-type: none"> ➤ Amendments to some legal acts on stimulation of innovation activity ➤ State program of industrial-Innovation development 2015-2019
Infrastructure	<ul style="list-style-type: none"> ➤ Park of information technologies ➤ 8 technoparks ➤ 1 sectoral design offices 	<ul style="list-style-type: none"> ➤ Nazarbayev University ➤ Park of Innovation technologies ➤ 8 technoparks ➤ 4 sectoral design offices ➤ 21 office of commercialization ➤ 5 international centers for technology transfer 	<ul style="list-style-type: none"> ➤ Development of intellectual - innovation clusters ➤ Sales of industrial parks and design offices to private sector ➤ Creation of innovation workshops, fablabs, co-working centers ➤ Development of technology transfer network
Instruments	<ul style="list-style-type: none"> ➤ Funding of science programs ➤ Project funding ➤ Venture funding 	<ul style="list-style-type: none"> ➤ Funding of science programs ➤ Project funding ➤ Venture funding ➤ 9 types of innovation grants ➤ Technological business incubation ➤ Targeted technological programs 	<ul style="list-style-type: none"> ➤ Funding of science programs ➤ Support for venture funds ➤ Increasing sums of innovation grants ➤ Support for innovation infrastructure ➤ Targeted Technological Programs ➤ Online centers of competences
Result	<p>In 2009</p> <ul style="list-style-type: none"> ✓ Innovation activity of enterprises 4% ✓ Innovation production in GDP 0,51 % ✓ Kazakhstan in GIC WEF funding - 72 	<p>In 2014</p> <ul style="list-style-type: none"> ✓ Innovation activity of enterprises 8,1% (2013 – 8%) ✓ Innovation production in GDP 1,5% (2013 - 1,7%) ✓ Kazakhstan in GCR WEF ranking 50 (2013 – 50) 	<p>Plan for 2019</p> <ul style="list-style-type: none"> ✓ Innovation activity of enterprises 20% ✓ Innovation production in GDP 2,5 % ✓ Kazakhstan in the GIC WEF ranking - 40



State Program "Productivity 2020"

No	Instrumentation of state support	Scale of state support	Maximum amount of state support
1	Long-term lease financing	Period: maximum 10 years Remuneration rate 5% Co-financing – not less than 15% The value of the leased asset – not less than 150 mln. tenge	
2	Reimbursement of expenses on the development and/or examination of comprehensive investment project plan		
2.1	Reimbursement of expenses on the development of investment project comprehensive plan for a purpose of long-term lease financing	50%	Maximum amount is 2 mln. tenge
2.2	Reimbursement of expenses on the development and / or examination of the feasibility study for the projects included in the Industrialization Map	50%	Maximum amount is 15 mln. tenge
3	Reimbursement of investments in increasing the competence of enterprises		
3.1	Reimbursement of expenses on trainings, including training for top managers	40%	Maximum amount is 2 mln. tenge per 1 employee (not more than 15 employees per company in a year)
3.2	Reimbursement of expenses on implementation of the best manufacturing practices by involving experts	40%	Maximum amount is 9 mln. tenge per 1 expert (not more than 3 experts per company in a year)



State Program "Productivity 2020"

No	Instrumentation of state support	Scale of state support	Maximum amount of state support
4	Reimbursement of expenses on the improvement of technological processes		
4.1	Reimbursement of expenses on the technical audit of enterprise	50%	Maximum amount is 8 mln. tenge for SME Maximum amount is 16 mln. tenge for big companies
4.2	Reimbursement of expenses on the improvement of technological processes	40%	Maximum amount is 30 mln. tenge
5	Reimbursement of expenses on improvement of the efficiency of production process organization		
5.1	Reimbursement of expenses on the design of a plan for improvement of the efficiency of production process organization	40%	Maximum amount is 5 mln. tenge
5.2	Reimbursement of expenses on implementation of a plan for improvement of the efficiency of production process organization	40%	Maximum amount is 15 mln. tenge

Support tools:

- Technological foresight
- Target technology programs
- International cooperation
- Experts database

**Identification of trends
in technology and
innovation development**

Support tools:

- International centers for
technology transfer
- Park of innovation technologies
- Industrial design offices

**Development of
“smart” technology
transfer system**

Support tools:

- 9 types of innovation grants

**Innovation
grants**



**Promotion of innovation
activities**

Support tools:

- Innovation contests
- Innovation congress
 - TV shows
 - Exhibitions
- Workshops

Investment activities

Support tools:

- Project financing
- Venture financing

**Commercialization of
R&D and technology**

Support tools:

- Technological business-incubation
- Commercialization offices and
centers

No	Grant assignment	Period / Amount
1037	TECHNOLOGY COMMERCIALIZATION	1 phase 6 /12 months/ 5 mln tenge 2 phase 24 months/ 25 / 50 mln tenge 3 phase 36 months/ 100 000 mln tenge
1035	PROFESSIONAL DEVELOPMENT ABROAD FOR ENGINEERING STAFF	≤ 3 months , 2 mln tenge/person, 1 company with the maximum number of employees 10
	ATTRACTING OF HIGHLY QUALIFIED FOREIGN PROFESSIONALS	≤ 12 months , 9 mln tenge/person, 1 company with the maximum number of employees 3
	ATTRACTING OF CONSULTING COMPANIES, PROJECT MANAGING ANF ENGINEERING ORGANIZATIONS	Consulting: 6 months/ 5 mln tenge Engineering: 12 months/ 30 mln tenge
	IMPLEMENTATION OF MANAGEMENT AND PRODUCTION TECHNOLOGIES	≤ 12 months/15 mln tenge
1036	TECHNOLOGY ACQUISITION	36 months/ 150 mln tenge / 36 months/ 400 mln tenge
	SUPPORT OF HIGH-TECH PRODUCTS DEVELOPMENT	36 months/ 50 mln tenge
	INDUSTRIAL RESEARCH	20 months / 30 mln tenge / 36 months /800 mln tenge

Regional Infrastructure



- 8 regional technoparks
- 5 engineering design offices
- 5 venture funds

- 5 Regional offices for innovation development
- 21 commercialization offices

- 9 special economic zones
- 16 social-entrepreneurial corporations

FINANCIAL SUPPORT FOR INNOVATION PROJECTS



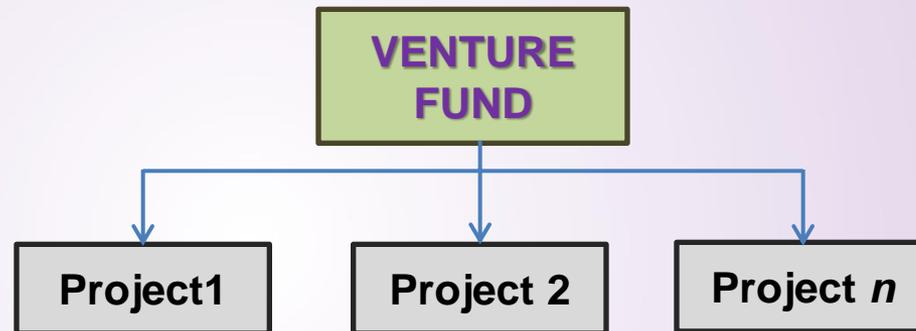
≤ 49%

≥ 51%



Private partner

VENTURE FUNDING

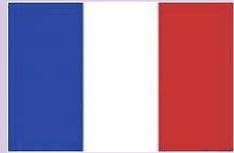


Terms of NATD

- Duration of participation in Venture Fund – **up to 7 years**
- Maximum amount – **\$15,6 millions US dollars**
- Venture Funds can finance projects **up to 100%** of project costs



International Centers for Technology Transfer



Technology Transfer in Paris (France)
since 2010
**Projects for technology transfer
in mechanical engineering,
infrastructure, agriculture**



Technological Cooperation in Tampa (Florida,
US)
since 2013.
**Projects for technology transfer in IT,
green technologies**



Kazakhstan-China Technological
Cooperation Center (Beijing, PRC)
since 2014
**Projects for technology transfer
in ICT, physics**



Technological Cooperation in
Astana (Kazakhstan)
and Daedeok Innopolis (Korea)
since 2011.
**Projects for technology
transfer in bio, energy, IT**



Technological Cooperation in Oslo
(Norway)
since 2013.
**Projects for technology transfer
in oil and gas, green
technologies**

implemented 29 joint projects,
currently 14 joint projects (in biotechnology, ICT, energy efficiency).

**4. Improvement of legislative base in
the field of entrepreneurship
development and support of
commercialization**

Recommendation 5.3

The authorities should aim to strengthen the role of intellectual property rights as a driver of the country's innovative development by:

- Clearly defining the options for transferring of ownership of publicly funded research results from the state (government) to the (public or private) agent performing the research, down to the level of the individual inventor;*
- Establishing clear incentives for innovation by protecting the rights of researchers and scientists, while creating favorable conditions for the creation of firms based on the results of their research;*
- Providing precise guidelines that allow knowledge organizations to understand the opportunities and limitations of IPRs and offer guidance on how to deal with the different options. Based on this, organizations would be able to develop their own intellectual property guidelines, providing clear and strong incentives to the inventor;*
- Facilitating preliminary IPR evaluation in an accelerated regime. Model applications and contracts covering a range of situations should be made available;*

and

- Using the information resulting from the IPR application process to improve understanding of the effectiveness of innovation support initiatives and overall innovation performance.*

Recommendation 5.4

The authorities should consider introducing specific measures to develop the capacities of public education and research institutions to perform efficiently their role in the national innovation system, in particular, by:

- Identifying the capabilities of public education and research institutions to perform different functions (education, scientific, entrepreneurial and mediating) in a realistic way that is based on current strengths;*
- Introducing **criteria in the evaluation of knowledge producing organizations that reflect the different achievements expected from them.** In addition to traditional indicators on research and education, these could also include the measurable effects of external linkages, commercialization and technology-transfer activities, academic entrepreneurship and others; and*
- Formulating a development plan for public institutions to reinforce ISL,** based on an analysis of the starting level, the identification of strengths and weaknesses of existing links and current and potential partners.*

Law “On the commercialization of scientific and (or) scientific and technical activities” (signed on 12/11/2015)

Main provisions

- Protection of intellectual property rights
- Legal regulation of establishment by public higher education institutions and public research organizations, start-up companies for commercialization of the results of scientific and technological activities
- The distribution of the IPR obtained as a result of accomplishment of the state contract
- Innovative S&T programs
- Innovation grants
- Government incentives to use the results of intellectual creative activity

Entrepreneurial Code of the Republic of Kazakhstan (signed on 30.10.2015)

aimed at implementation of the "Nation Plan - 100 concrete steps to implement the five institutional reforms."

- PUBLIC-PRIVATE PARTNERSHIP
- STATE SUPPORT OF ENTERPRENEURSHIP
- STATE SUPPORT OF AGRICULTURAL and the non-agricultural business activities in rural areas
- STATE SUPPORT of industrial innovation

State support of entrepreneurship are carried out in the following areas:

- 1) small and medium enterprises;
- 2) agribusiness and non-agricultural entrepreneurial activities in rural areas;
- 3) industrial innovation;
- 4) special economic zones;
- 5) investment activities;
- 6) Entrepreneurship activity of domestic producers.

Thank you!

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