



# **Better Policies for More Innovation Assessment – Implementation –Monitoring**

## **R&D SECTOR OF ARMENIA: STATE PROGRAMS**

**V. Sahakian**

**STATE COMMITTEE OF SCIENCE  
MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF ARMENIA**

**Minsk, 17- 18 November 2015**

# R&D Sector: **LEGAL BASIS**

## **Laws:**

- **Law on the Scientific and Technical Expertise (April 2015)**
- **Law on the National Academy of Sciences of RA (April, 2011)**
- **Law on the Scientific and Technical Activities (December, 2000)**

## **Government Resolutions:**

- **Science and Technology Development Priorities for 2015-2019 (25.12.2014, N 54)**
- **Strategy on Development of Armenology for 2012-2025 (12.01.2012, N 1)**
- **Action Plan on Development of Science for 2011-2015 (17.06.2011, N 23)**
- **Program to Promote the Development of Social Sciences for 2011-2015 (18.03.2011, N 10)**
- **Science and Technology Development Priorities for 2010-2014 (27.05.2010, N 640-N)**
- **Strategy on Development of Science for 2011-2020 (27.05.2010, N 20)**

# KEY STI PLAYERS - POLICY

## **State Committee of Science (2007):**

- To address the fragmented character of policy-making,
- To improve policy-making and coordination,
- Responsible for implementation of RTD programmes.

## **Government resolution (2015):**

State Committee of Science was recognized as authorized body responsible for development and implementation of policy in the field of scientific and technological expertise.

## **Government resolution (2006):**

Ministry of Economy was recognized as authorized body responsible for development and implementation of innovation policy, in co-operation and coordination with other concerned ministries and organizations.



# KEY STI PLAYERS - RTD

- **Founded in 1943 the National Academy of Sciences (NAS RA) remains to be main R&D performer in the country (35 institutes/79 total; 3700 staff/around 6000 total).**
- **NAS RA is the highest self-governing research organization carrying out & coordinating basic and applied research directed to creation of knowledge-based economy, contributing to social and cultural development of the country (Law).**
- **Official scientific consultant to the highest governing bodies.**

# R&D Sector: Strategy

Strategy on Development of Science for 2011-2020.

Approved by the Government on May 27, 2010

*Our vision: By 2020 Armenia is a country with knowledge-based economy and competitive within the European research area with its level of basic and applied researches*

Achievement of prime location for scientific specialization within the European research area

Creation of synergetic system of education, science and innovation

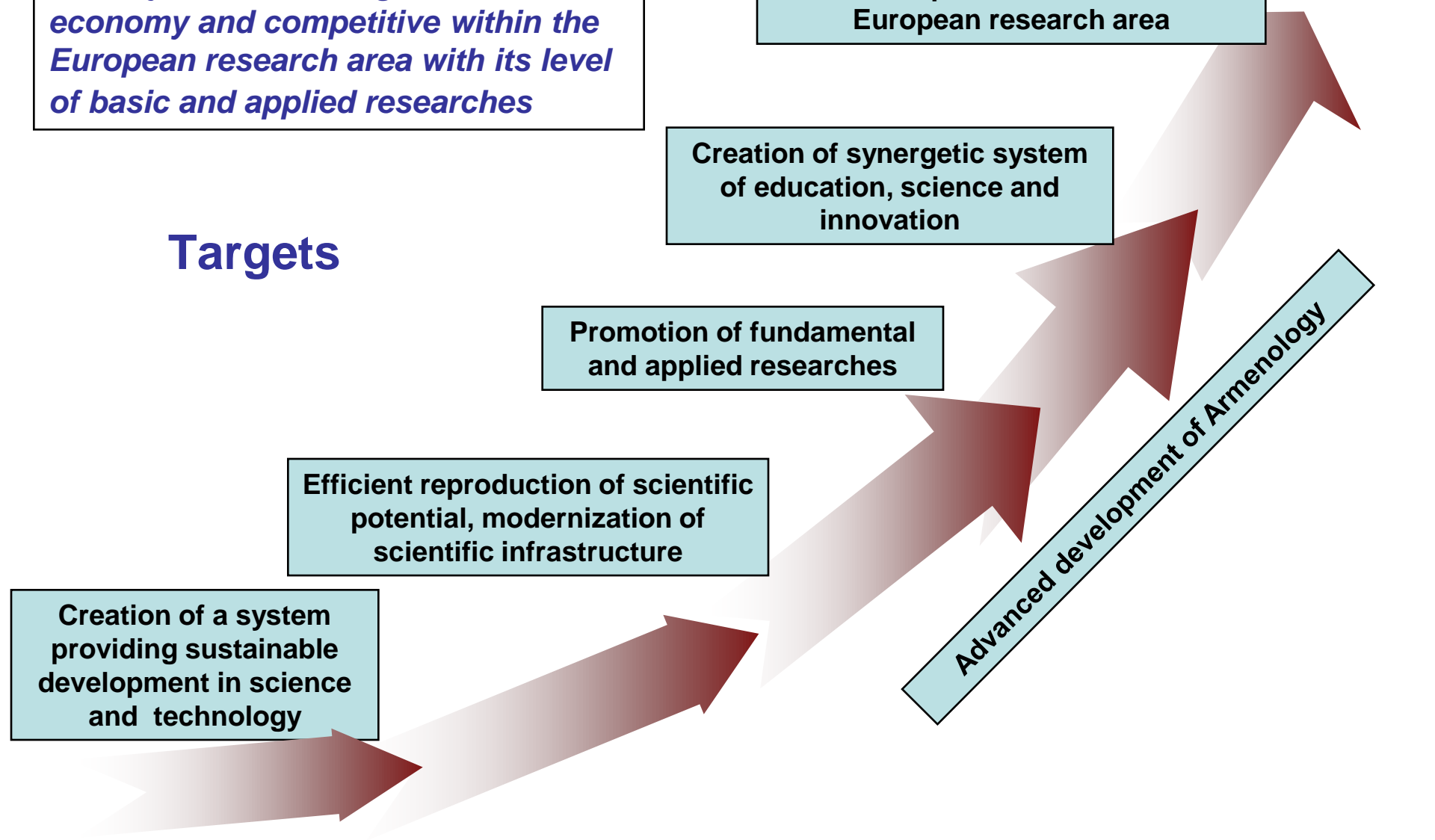
Promotion of fundamental and applied researches

Efficient reproduction of scientific potential, modernization of scientific infrastructure

Creation of a system providing sustainable development in science and technology

**Targets**

Advanced development of Armenology



# **R&D Sector: Action Plan on Development of Science for 2011-2015**

**Action Plan on the Development of Science for 2011-2015**  
Approved by the Government on June 17, 2011

- Improving the S&T management system and ensuring adequate conditions for the sustainable development**
- Measures on increasing the number of young and talented specialist involved in research, education and technological development, upgrading of research infrastructure**
- Creating adequate conditions for the development of integrated science, technology and innovation system**
- Developing international cooperation in RTD**



# **R&D Sector: Priorities**

**Science and Technology Development Priorities for 2015-2019.**

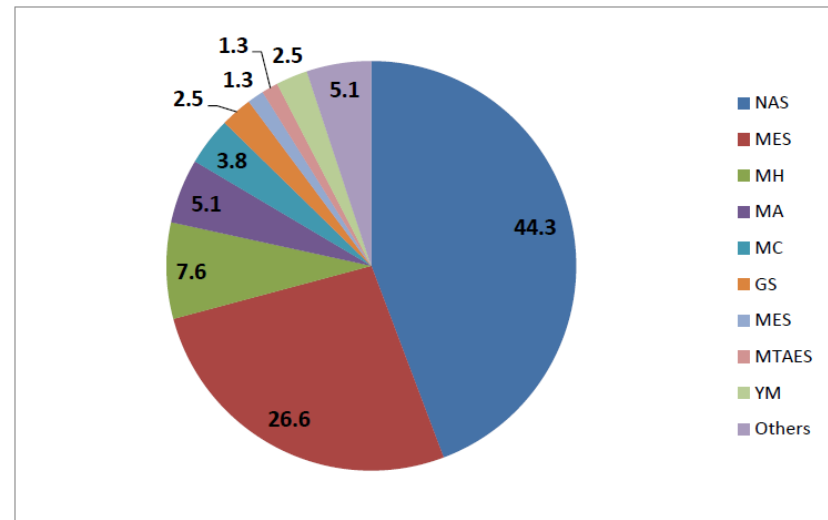
Approved by the Government on December 25, 2014

- 1. Armenology**
- 2. Life Sciences**
- 3. Secure and Efficient Energy**
- 4. Key Enabling Technologies, Information and Communication Technologies**
- 5. Space, Earth Sciences, Sustainable Use of Natural Resources**
- 6. Basic Researches for Key Problems of Scientific and Socio-Economic Development**

# R&D Sector: Structure

## Number of Research Organizations at Ministries and National Academy of Sciences

Ministry/ NAS/ Yer. Mun.	Research Institutes, Universities and Research Institutes Affiliated to Research Centers or Foundations Involved in State Programs: 2014
National Academy of Sciences	35
Ministry of Education and Science	21
Ministry of Healthcare	6
Ministry of Agriculture	4
Ministry of Culture	3
Governement Staff	2
Ministry of Economy	1
Ministry of Territorial Administration and Emergency Situations	1
Yerevan Municipality	2
Others	4
<b>Total</b>	<b>79</b>



### NUMBER OF EMPLOYEES

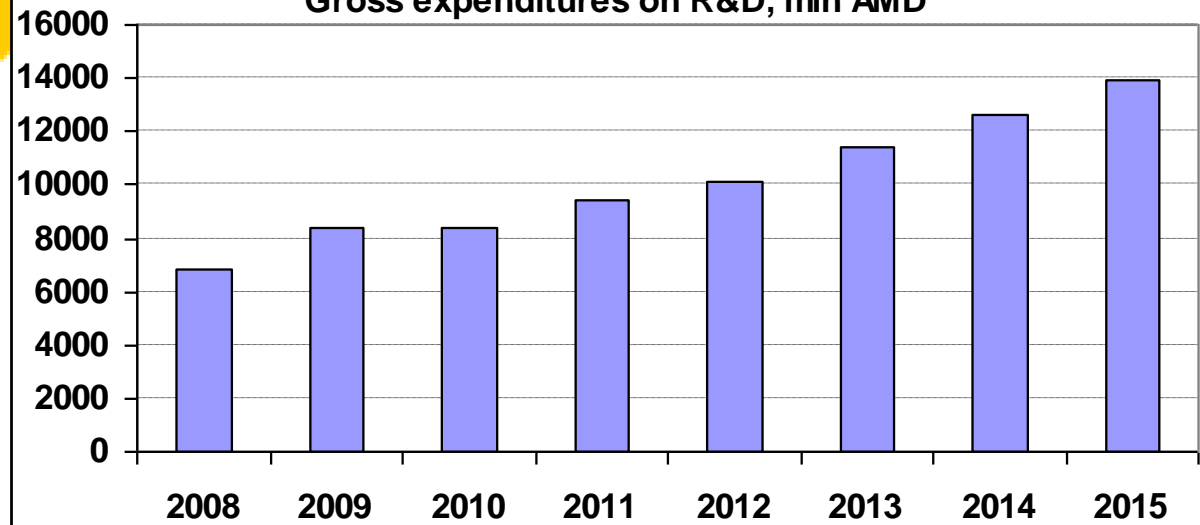
	Researchers and Techincians	Support personnel	Other	Total
2009	5895	614	417	6926
2010	5460	672	426	6558
2011	4748	566	404	5718
2012	4421	556	621	5598
2013	4234	605	391	5230

Source: <http://www.armstat.am>

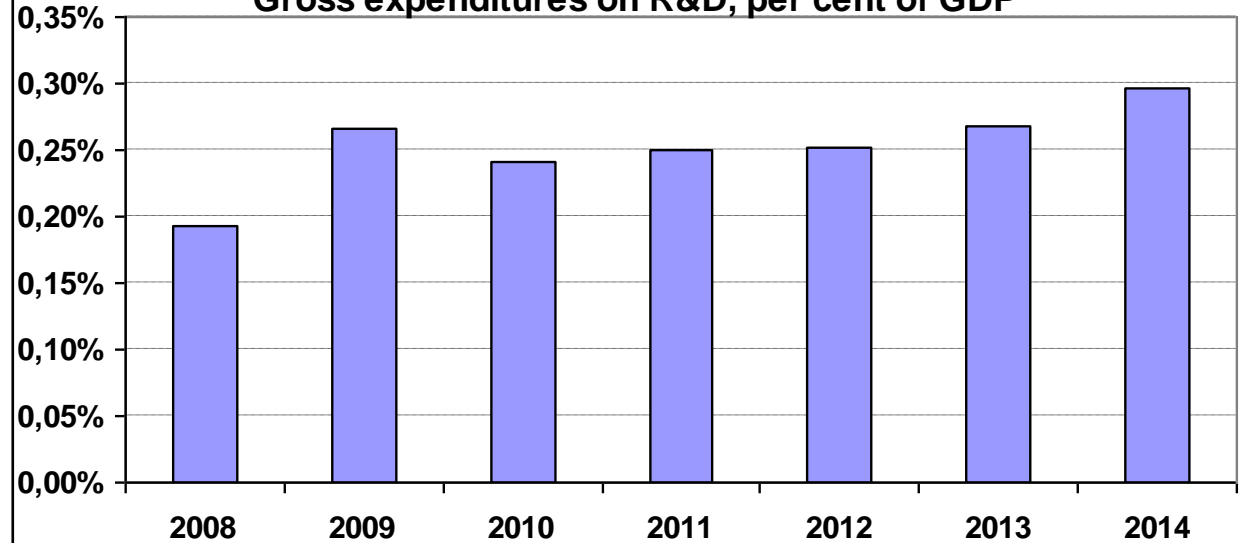


# Gross expenditures on R&D

Gross expenditures on R&D, mln AMD

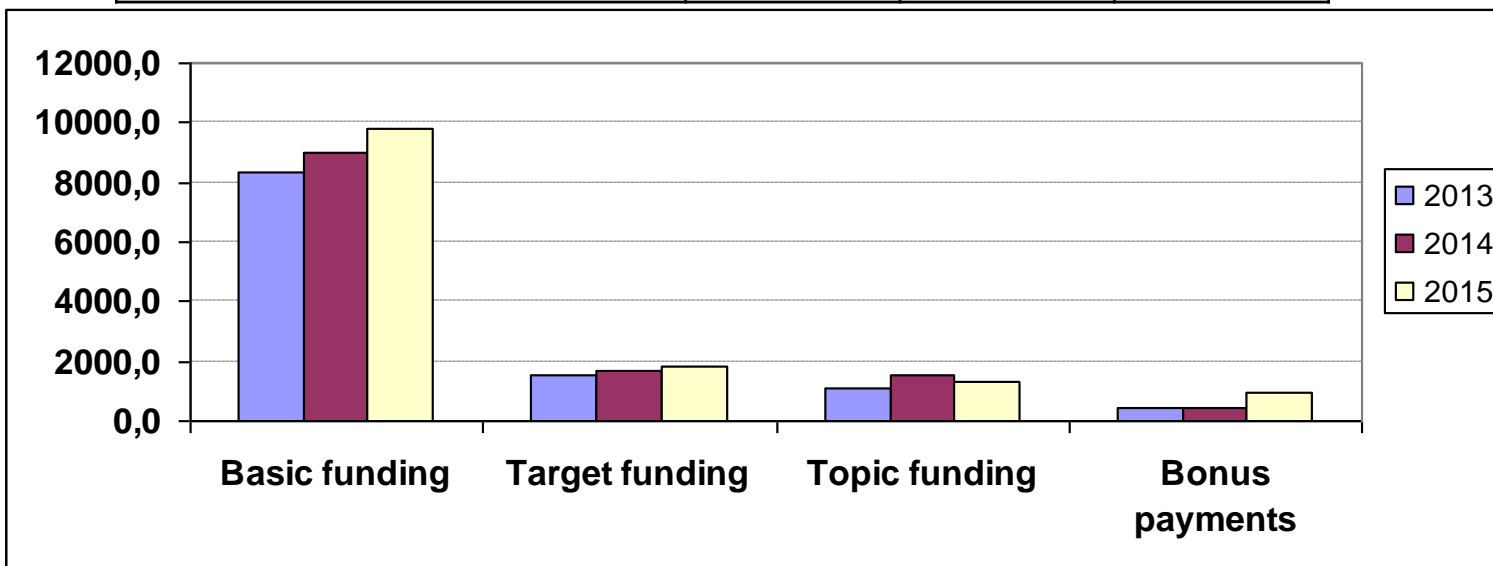


Gross expenditures on R&D, per cent of GDP

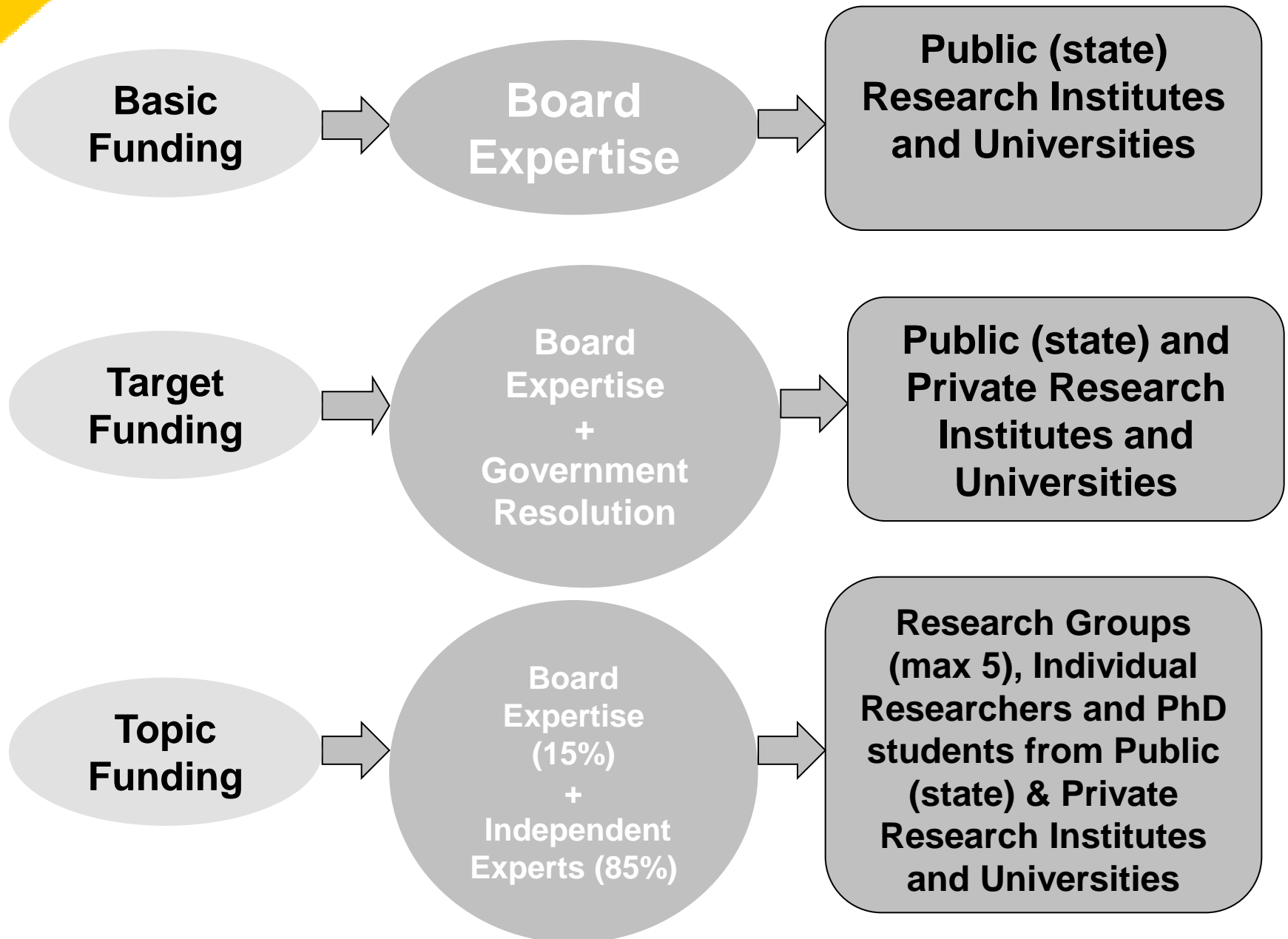


# State funding of science- 2013-2015

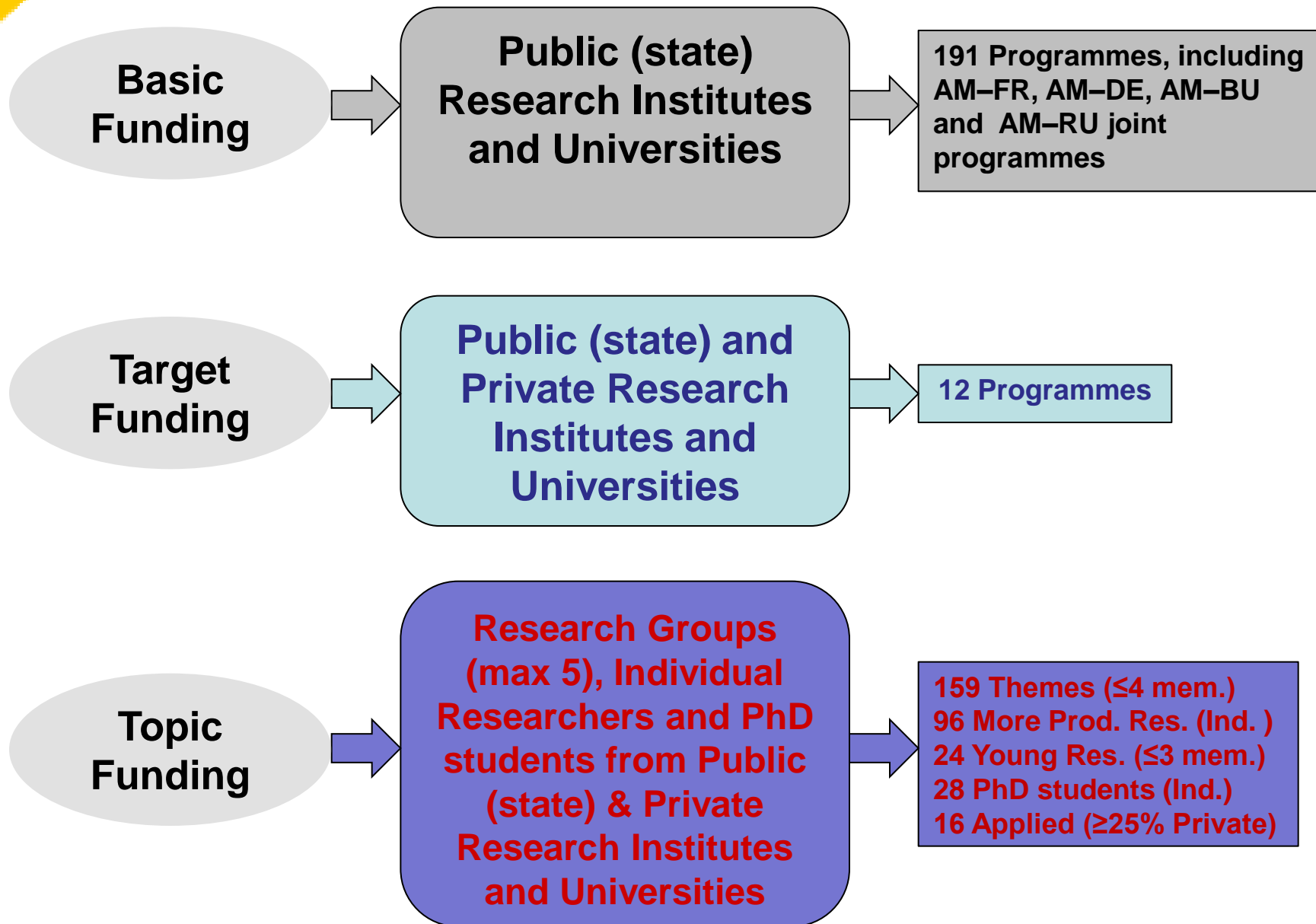
Budgetary funding of science, 2013-2015, AMD mln			
	2013	2014	2015
<b>Basic funding</b>	<b>8348,926</b>	<b>9025,448</b>	<b>9811,005</b>
Share of total funding	73,02%	71,28%	70,47%
<b>Target funding</b>	<b>1536,726</b>	<b>1675,270</b>	<b>1839,406</b>
Share of total funding	13,44%	13,23%	13,21%
<b>Topic (thematic) funding</b>	<b>1106,507</b>	<b>1515,691</b>	<b>1333,011</b>
Share of total funding	9,68%	11,97%	9,57%
<b>Bonus payments to scientists with academic degree</b>	<b>441,0</b>	<b>446,4</b>	<b>938,7</b>
Share of total funding	3,86%	3,53%	6,74%
<b>Total funding</b>	<b>11433,159</b>	<b>12662,809</b>	<b>13922,121</b>



# R&D Sector: Scientific Expertise

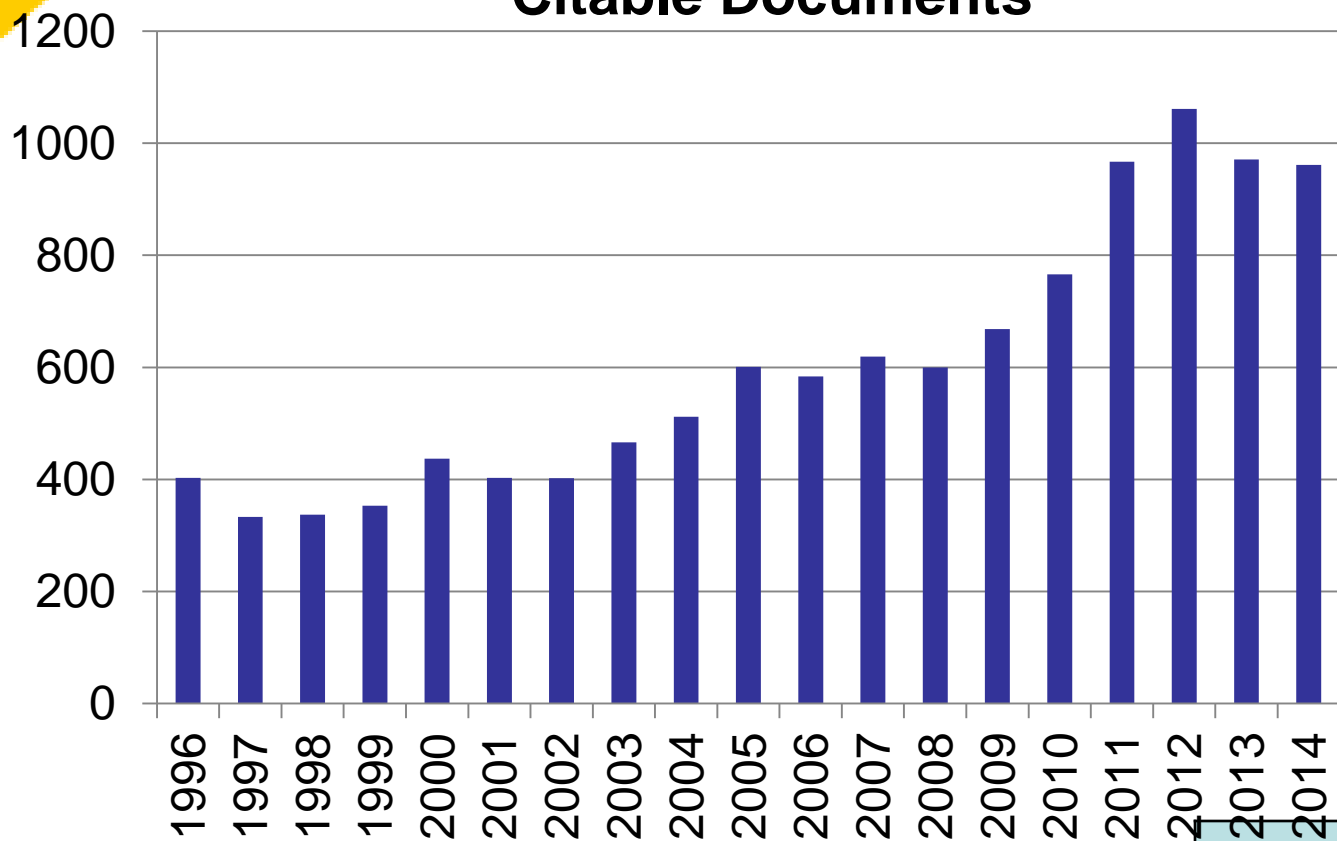


# R&D Sector: State Programmes-2014



# R&D Sector: Publications 1996-2014

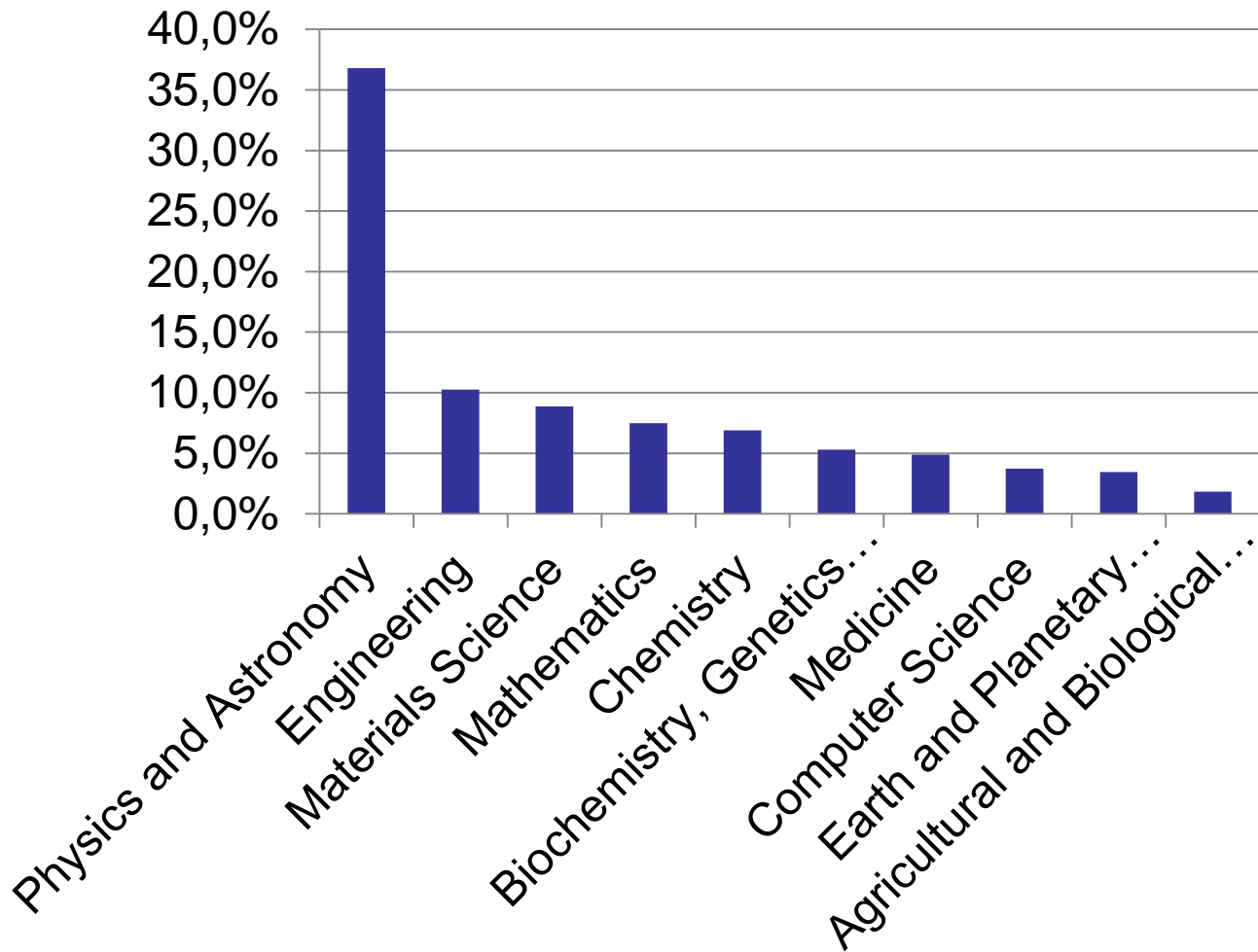
## Citable Documents



<b>Total</b>	<b>1996-2014</b>
<b>H Index</b>	<b>126</b>
<b>Documents</b>	<b>11.741</b>
<b>Citable Documents</b>	<b>11.441</b>
<b>Citations</b>	<b>113.464</b>
<b>Self Citations</b>	<b>19.563</b>
<b>Citations per Document</b>	<b>9,66</b>

# R&D Sector: Publications 1996-2014

## Top 10 subjects



# R&D Sector: Bilateral Joint Programmes

**State Committee  
of Science  
(SCS, Armenia)**

**Centre National de la Recherche  
Scientifique (CNRS France)**

From 2009. By 2015  
2 joint laboratories; 1 joint  
group; 20 annual travel grants

**Foundation for Fundamental  
Research (FFR, Belarus)**

From 2011. By 2015  
34 annual grants

**Russian Foundation for  
Humanities (RFH, Russia)**

From 2011. By 2015  
12 annual grants

**Russian Foundation for Basic  
Research (RFBR, Russia)**

From 2013. By 2015  
42 annual grants

**Federal Ministry of Education  
and Research (BMBF, Germany)**

From 2013. By 2015  
10 annual grants

**State Agency for Science,  
Innovation and  
Informatization (SASII, Ukraine)**

From 2013. Was intended to  
start from 2014, we hope it  
will start in 2016

**State Science and Technology  
Committee (SSTC, Belarus)**

From 2015. By 2015  
1 targeted with the duration of  
5 year research program

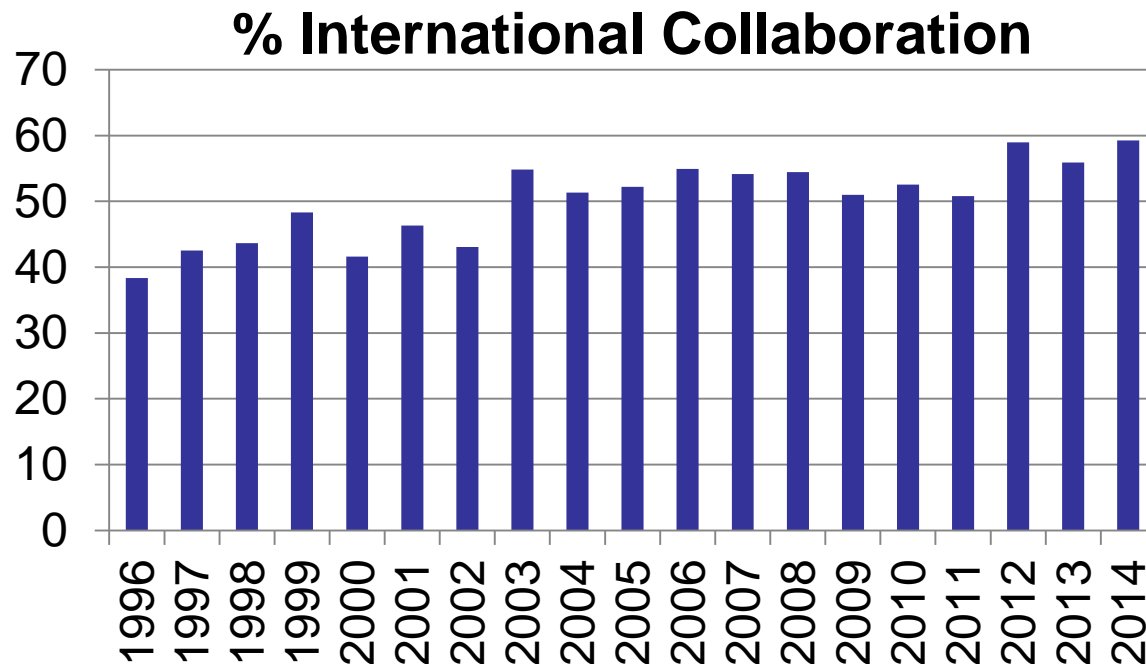
# R&D Sector: International Cooperation

SCS bilateral cooperation agreements with CNRS (France), BMBF (Germany), RFBR (Russia), FFR (Belarus), RFH (Russia), SASII (Ukraine), MST(China), ICTP (Italy), etc.

NAS cooperation agreements with AS of Hungary, Romania, Russia, Moldova, Georgia, Belarus, Ukraine, China, etc.

Cooperation with major European Research Centers & Universities on Institutional Level

Cooperation within large scale scientific collaborations and experiments: LHC, DESY, HESS, MAGIC, CEBAF, etc.





# R&D Sector: Publications 2004-2013

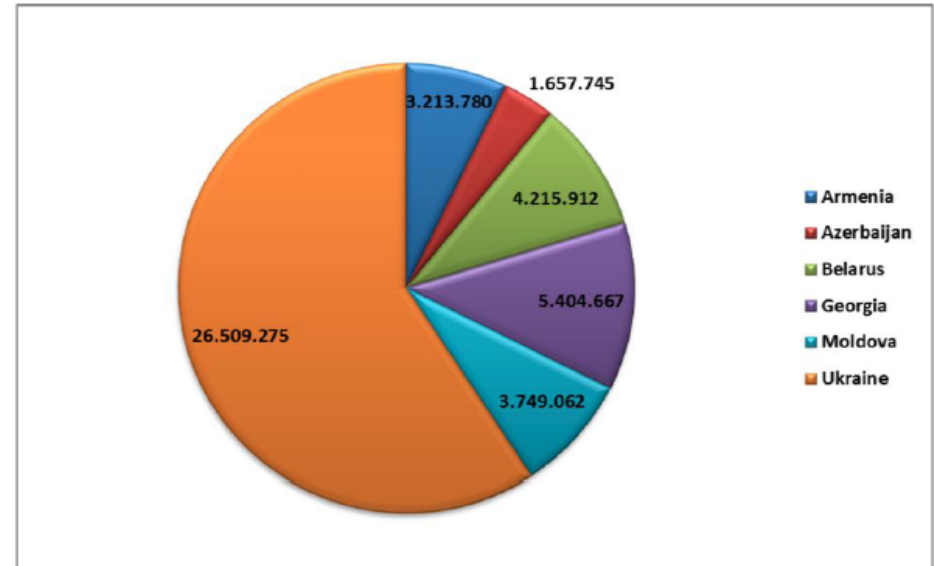
Thomson Reuters: InCites

## TOP 10 COLLABORATION COUNTRIES BY NUMBER OF JOINT PUBLICATIONS



# EaP participation in FP7: 2007-2013

	Total cost of the participations	EC contribution to the participations
Armenia	3.799.268 €	3.213.780 €
Azerbaijan	1.895.229 €	1.657.745 €
Belarus	5.091.239 €	4.215.912 €
Georgia	6.295.777 €	5.404.667 €
Moldova	4.734.773 €	3.749.062 €
Ukraine	34.893.803 €	26.509.275 €
<b>TOTAL</b>	<b>56.710.089 €</b>	<b>44.750.441 €</b>



T. Devars, EU Research and Innovation cooperation with EaP countries, Brussels, 3 February 2015

## Success Rates

AM	AZ	BY	GE	MD	UA
20.7%	16.6%	19.6%	22.4%	19.0%	19.2%

**EU average: 20.5%**

M. Penny, "Participation of Eastern Partnership countries in FP7: Lessons Learned" Horizon 2020 Eastern Partnership Launch Event Chişinău, 17 March 2014

## **R&D Sector: Participation in H2020**

- **Official application for association – August, 2013**
- **First round of Negotiations – February 10, 2015**
- **Inclusion of participation fee in Medium-Term Expenditure Framework of Science for 2016-2018 – May, 2016**
- **Inclusion of H2020 participation fee for 2016 in Science Budget project for 2016 – September, 2016**
- **Approval of Science Budget for 2016 (including H2020 participation fee) by Government – October 1, 2016**
- **Approval of H2020 Association Agreement by Government – October 29, 2016**
- **Second round of Negotiations – October 30, 2015**
- **Third round of Negotiations – November 13, 2015**
- **Signature of Agreement – scheduled for January, 2016**

# R&D Sector: Evaluation of S&T&I System

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

## Innovation Performance Review



UNITED NATIONS

The *Innovation Performance Review of Armenia* was prepared by a group of international and national experts as well as staff of the UNECE Secretariat. The *Review* was the result of a collective effort in which the lead authors for each chapter were: Mr. José Palacín (Chapter 1), Mr. Rumen Dobrinsky (Chapter 2), Mr. Thomas Stahlecker (Chapter 3), Mr. Slavo Radosevic (Chapter 4), Ms. Annamaria Inzelt, (Chapter 5), Ms. Anna Kaderabkova (Chapter 6), Mr. Manfred Spiesberger (Chapter 7) and Mr. Christopher Athey (Annex). Ms. Julia Djarova, Mr. José Molero and Mr. Zhumatay Salimov reviewed the first draft of the *Review* and provided relevant suggestions. During the discussion at the Substantive Segment of the eighth session of the Committee on Economic Cooperation and Integration, Mr. Ashot Khandanyan, Mr. Mikayel Melkumyan and Mr. Gagik Makaryan presented comments and suggestions on behalf of the delegation of Armenia. Mr. Christopher Athey, Mr. José Palacín and Mr. Ralph Heinrich contributed to the overall editing of the publication.



Inco-Net EaP

S&T Policy Mix Peer Review Armenia

March 2015

Report on the review of the Armenian S&T Policy Mix

Drafted by a review team of international experts:

**Azir Aliu, Team Member, Advisor**, Advisor to the Prime Minister of the FYR of Macedonia for Education, Science and Information Technology, Macedonia

**Krzysztof Gulda, Team Member, Advisor**, Member of the Science Policy Committee - Advisory Body to the Minister of Science and Higher Education, Poland

**Gerold Heinrichs, Team Leader, Head of Department Asia America Oceania**, International and European Cooperation, Project Management Agency at the German Aerospace Research Centre(DLR-PT), Germany

**Johanna Ringhofer, Team Member, Deputy Head of Unit**, Unit of EU Research Policy and Coordination, Ministry of Science and Research, Austria

**Thomas Reineke, Assistant to the Team**, Senior Scientific Officer, Unit CIS, International and European Cooperation, Project Management Agency at the German Aerospace Research Centre (DLR-PT), Germany

# R&D Sector: Implementation of Recommendations of IPRA and S&T PMPRA

- Some Recommendations such as *“Widening the understanding of innovation to include also non-technological aspects”*, *“To strengthen the industry-science linkages”*, *“Introducing initiatives that encourage collaborative R&D and innovation projects involving Armenian R&D institutes and businesses from other countries”*, etc are long term problems or conditioned by the structure and needs of economy.
- Some Recommendations such as *“Promoting successful business concepts and innovative companies as role models in the media and at national/international conferences, including with the support of the Armenian diaspora”* or *“ To strengthen efforts to increase innovation activities in the private sector”* refer to the measures which were implemented before the review and are continued to be implemented.
- Some Recommendations refer to the measures or targets containing in *“Strategy on Development of Science for 2011-2020”* as well as other recommendations will be included in *“Action Plan on Development of Science for 2016-2020”*.

# R&D Sector: Support of Applied Programs

**Financing of research projects targeted to the achievement of concrete applied results in the co-financing basis with private sector.**

**Program is implemented from 2011.**

**Duration of program - two years.**

**Maximal funding 30 mln AMD (about 60 000 EURO).**

**Level of co financing – at least 15% (2011-2013), 25% (2013-2015) and 35% (2015-2017).**

**Programs are selected on the basis of independent expertise.**

**2011-2015 – 42 application, 17 programs were funded.**

**2013-2015 – 32 application, 16 programs were funded.**

**2015-2017 – deadline for application- December 2015.**

**Distribution of programs by S&T fields:**

	2011	2013
Natural Sciences	6	3
Engineering & Technology	5	11
Medical Sciences	2	-
Agricultural Sciences	4	2



# R&D Sector: Infrastructure Modernization

**Implementation of program for modernization of scientific or technological infrastructure of public Research or Higher Education Institutes.**

**Program is annual and implemented from 2013.**

**Maximal funding 60 mln AMD (about 120 000 EURO).**

**Selection is based on independent scientific expertise.**

**Preference is given to the application with co financing from private sector.**

**Preference is given to the application in which more than one Research or Higher Education Institutes are interested.**

**Annually 5 grants are funded.**

## **Distribution of programs by S&T fields:**

- **Study of Ancient Manuscripts,**
- **Archeology,**
- **Physics,**
- **Biology,**
- **Technology (sensors)**
- **Biotechnology.**

# **R&D Sector: Evaluation of Research Organizations- Key Indicators (preliminary)**

**Evaluation of Research Activity (7 Criteria with 43 Sub-criteria)  
+  
Evaluation of 3- and 5-year Scientific Programmes**

## **1. Scientific and Technological Activity**

**1.1. Research**

**1.2. Personnel**

**1.3. Infrastructure**

**1.4. Integration with International Research Area**

**1.5. Integration with Higher Education System**

**1.6. Commercialization of Research Results**

**1.7. Financial Activities**

## **2. Programmes**

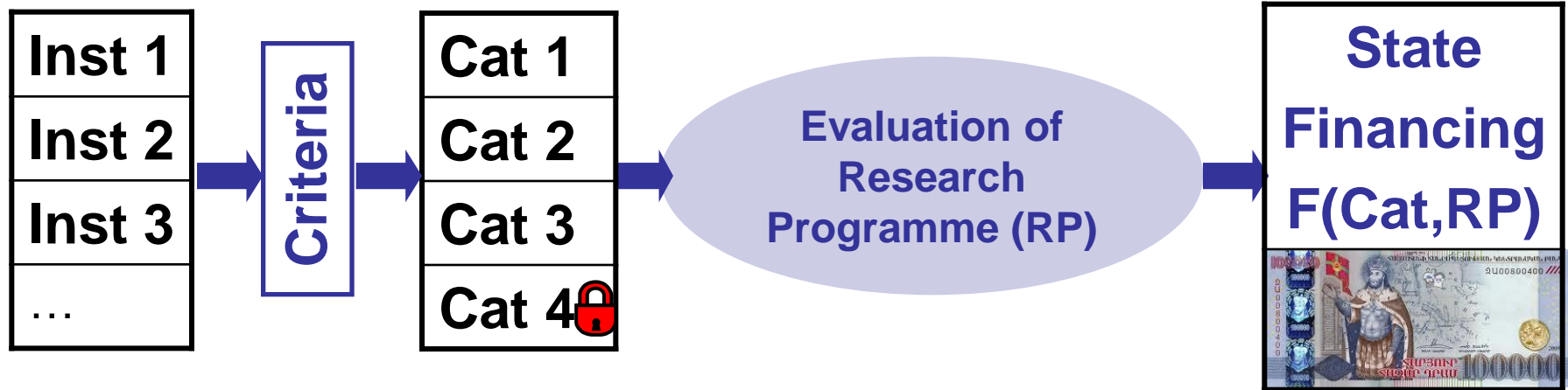
**2.1. 3-year Programme**

**2.2. 5-year Programme**

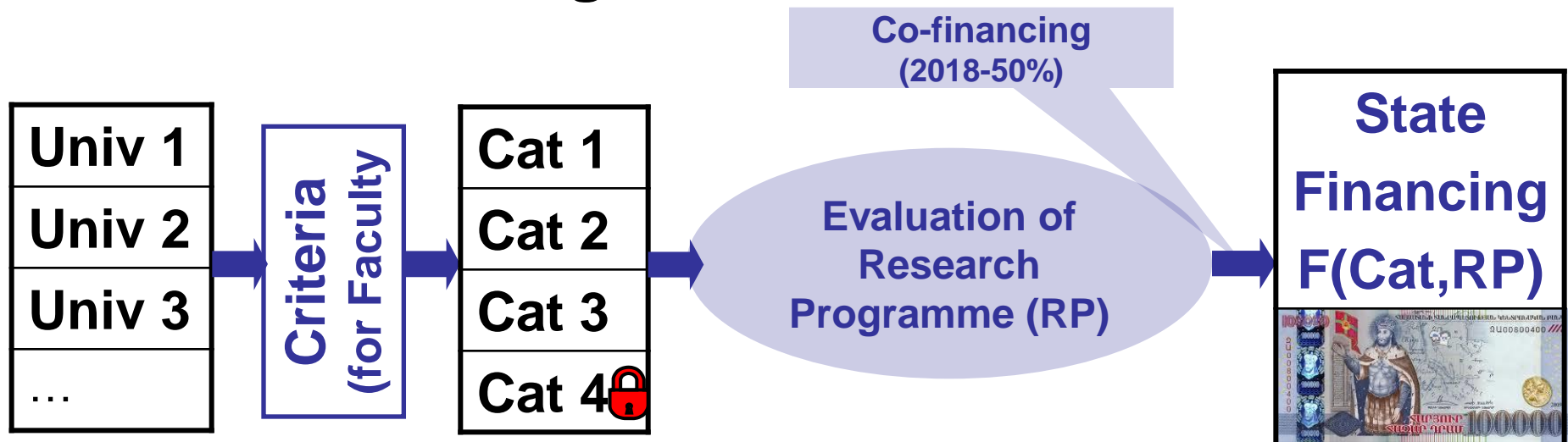


# R&D Sector: Evaluation of Research Organizations- Key Indicators (preliminary)

## Research Institutes



## Research in Higher Education Institutions



# R&D Sector: Commercialization of Research Results

## Strategic trends

Development and implementation of target programs aimed to the creation of knowledge based production

**“Science Development Programme for 2011-2015 and Action Plan”** (approved on 23 Jun 2011).

**“Science Development Programme for 2016-2020 and Action Plan”** (should be presented to Government in the end of 2015).

Involvement of private sector in R&D in the basis of cofinancing

**Two years programs on co financing basis with private sector** (from 2011)

Creation of innovation infrastructures at Universities and Research Institutes

**YerPhi, IPR, YSU, NPUA, Biotechnology,...**

Creation of Research Universities

**“Program on Creation of Technological Research University of Armenia”** (should be presented to Government in the beginning of 2016)

Implementation of large scale science-technological projects, having the meaning of regional system formation

**Center for Radiation Medicine will operate in the beginning of 2016,**  
**First step of CANDLE - project AREAL is finished in mid of 2015.**  
**Bilateral and international programs**

# R&D Sector: Large Scale Projects: YerPhI

Projects which will have a big influence on R&D sector

ALIKHANYAN NATIONAL SCIENCE LABORATORY(YEREVAN PHYSICS INSTITUTE)

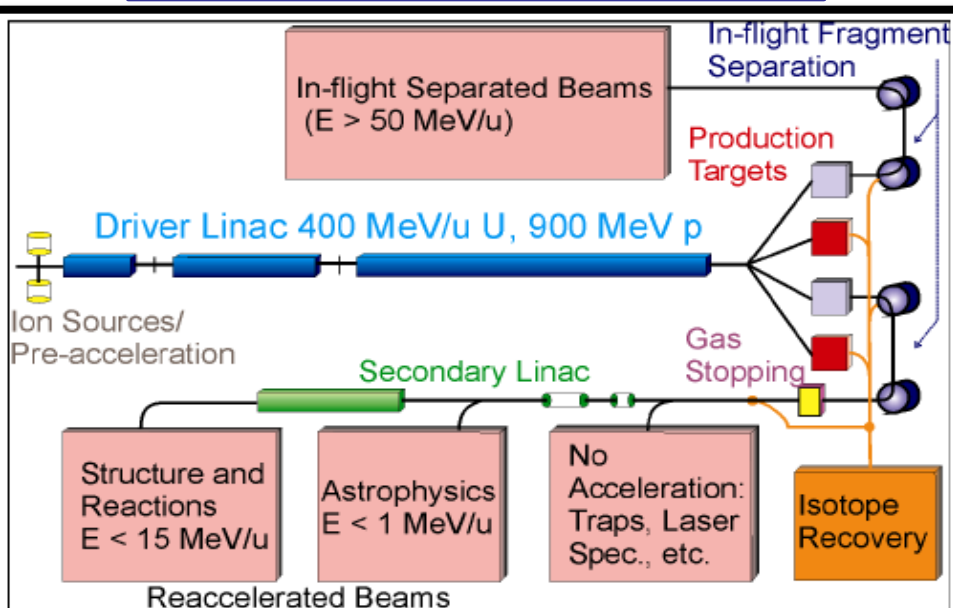
“On Establishment of Alikhanyan National Science Laboratory (Yerevan Physics Institute)”

(approved on 01 September 2011, 1301-N).



**NUCLEAR PHYSICS WITH  
RADIOACTIVE ION BEAMS**

**CENTER FOR  
RADIATION MEDICINE**



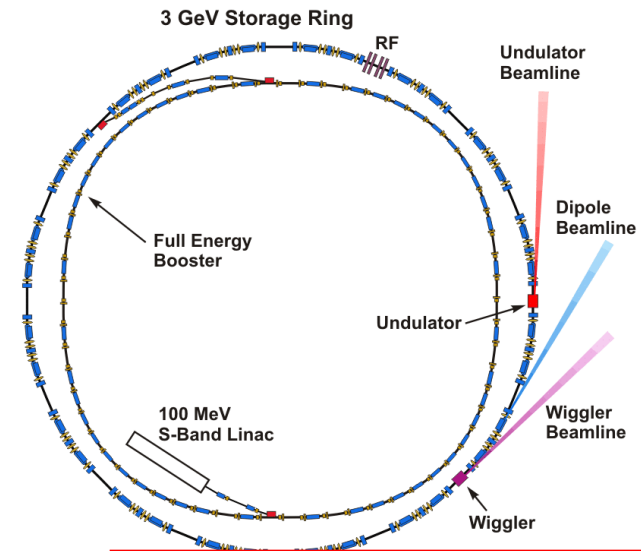
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# R&D Sector: Large Scale Projects: CANDLE



Projects which will have a big influence on R&D sector

## Center for the Advancement of Natural Discoveries using Light Emission



Signed MoU's: DESY, PSI, Kurchatov Center, Elettra...

Energy	3GeV	Current	350mA	Length of Circum.	216m	Frequency	500MHz	Emittance	8.4nm	Beam life time	18.4hrs
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From V. Tsakanov "CANDLE project"

# CONCLUSION

## Next steps:

- ✓ **Action Plan on the Development of Science for 2016-2020**
- ✓ **Program on Creation of Technological Research University of Armenia**
- ✓ **Young Researchers Support Program and Action Plan**
- ✓ **Evaluation of Research Organizations**
- ✓ **Improving Scientific and Technological Infrastructure**
- ✓ **Development of Policy Instruments Increasing Innovation Activities of Research Organizations**
- ✓ **Harmonization of R&D Statistics with International Standards**
- ✓ **Development of Roadmap for Research Infrastructures**
- ✓ **Development of Strategy for International Cooperation in R&D&I**
- ✓ **...**



**MINISTRY OF EDUCATION AND SCIENCE  
OF THE REPUBLIC OF ARMENIA  
STATE COMMITTEE OF SCIENCE**

**Thank you for your attention!**

**For more information:**

**[www.scs.am](http://www.scs.am)**