



TÜBİTAK

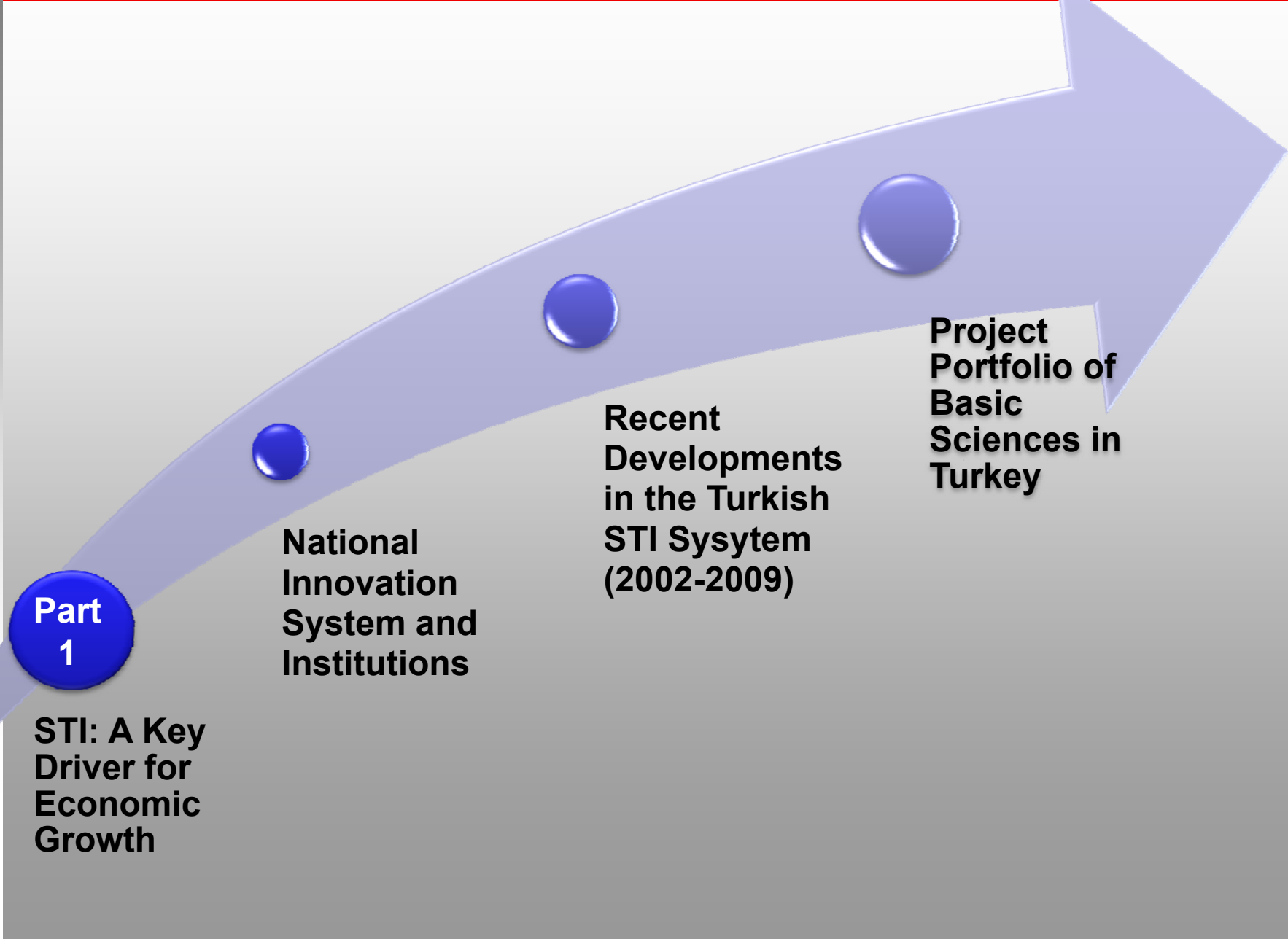
**Turkish Physical Society
27th International Physics Congress**

Recent Developments in Science, Technology and Innovation in Turkey

Prof. Dr. Nüket YETİŞ

President

14 September 2010, Istanbul



**Part
1**

**STI: A Key
Driver for
Economic
Growth**



**National
Innovation
System and
Institutions**



**Recent
Developments
in the Turkish
STI System
(2002-2009)**



**Project
Portfolio of
Basic
Sciences in
Turkey**

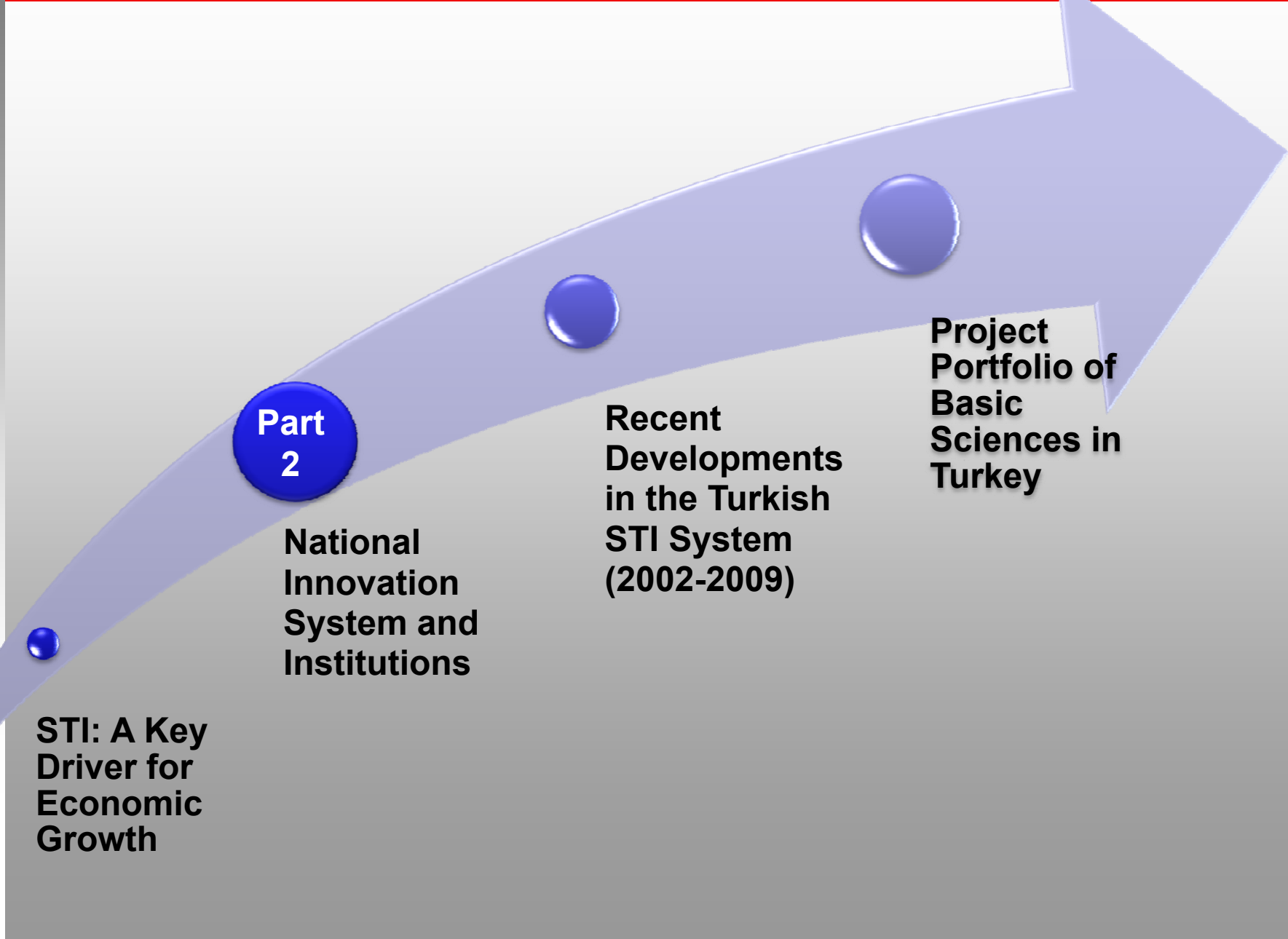
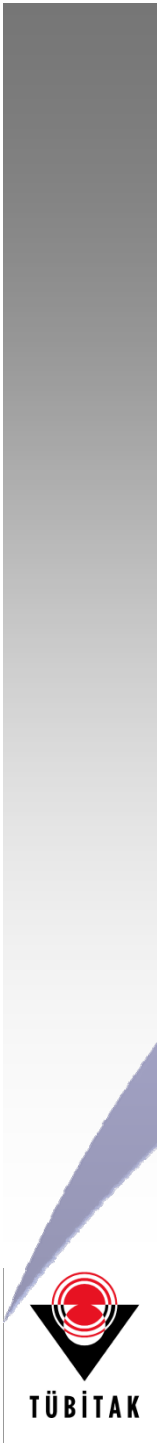


TÜBİTAK

In our age

Science, technology and innovation,
is the **key** instrument for;

- **Smart Growth:** developing an economy based on knowledge and innovation
- **Sustainable Growth:** promoting a more resource efficient, greener and more competitive economy
- **Inclusive Growth:** fostering a high-employment economy delivering social and territorial cohesion*



**Part
2**

**National
Innovation
System and
Institutions**

**Recent
Developments
in the Turkish
STI System
(2002-2009)**

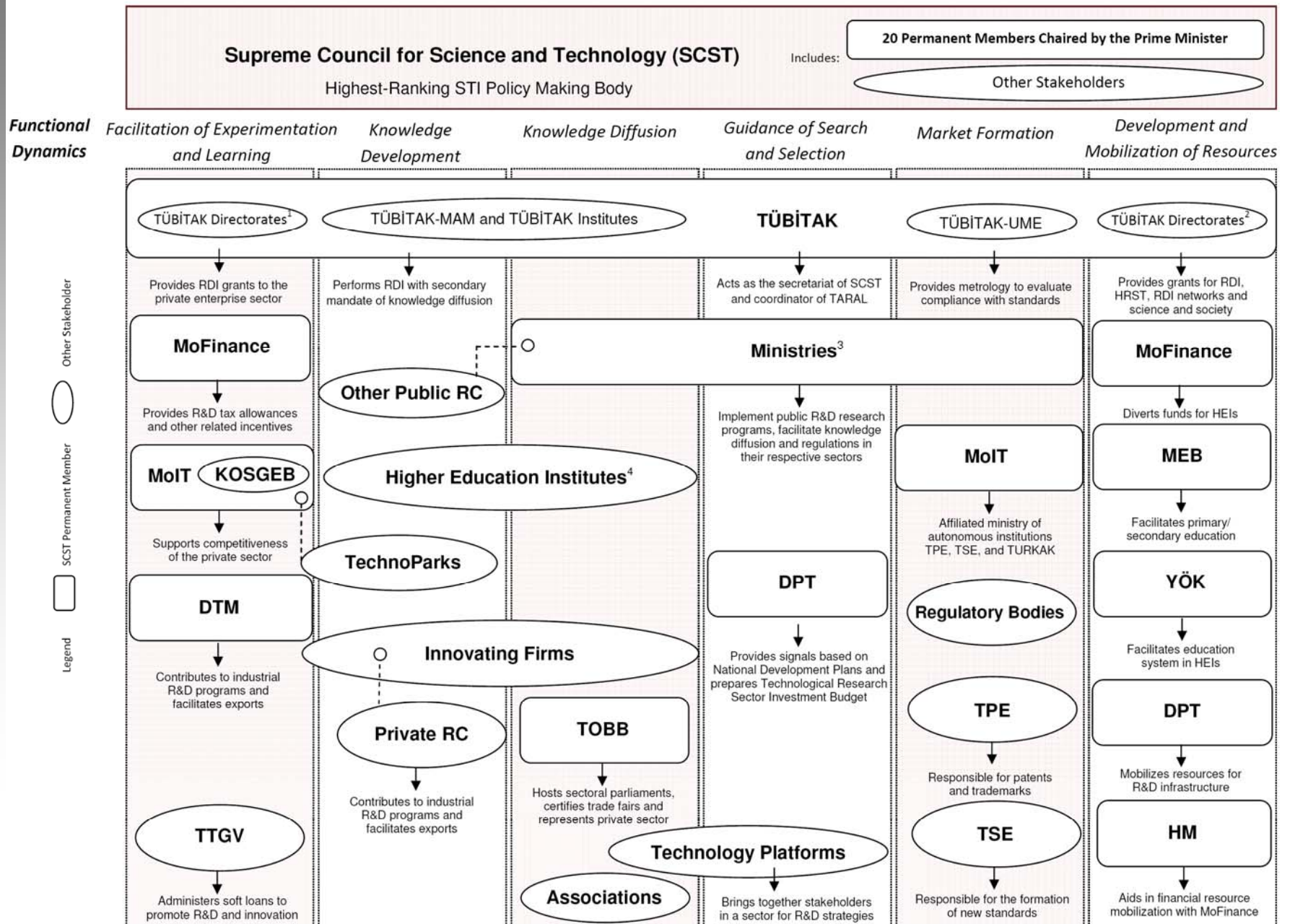
**Project
Portfolio of
Basic
Sciences in
Turkey**

**STI: A Key
Driver for
Economic
Growth**



TÜBİTAK

Main Actors of the Turkish STI and Their Systemic Functions



Turkish National STI System

Supreme Council for Science and Technology

BTYK / SCST

The Supreme Council for Science and Technology:
The highest ranking STI policy-making body in Turkey with the decision-making power for S&T and innovation policy.

Establishes long-term goals and targets by decree

Follows-up on recent STI developments

Assigns tasks for implementation

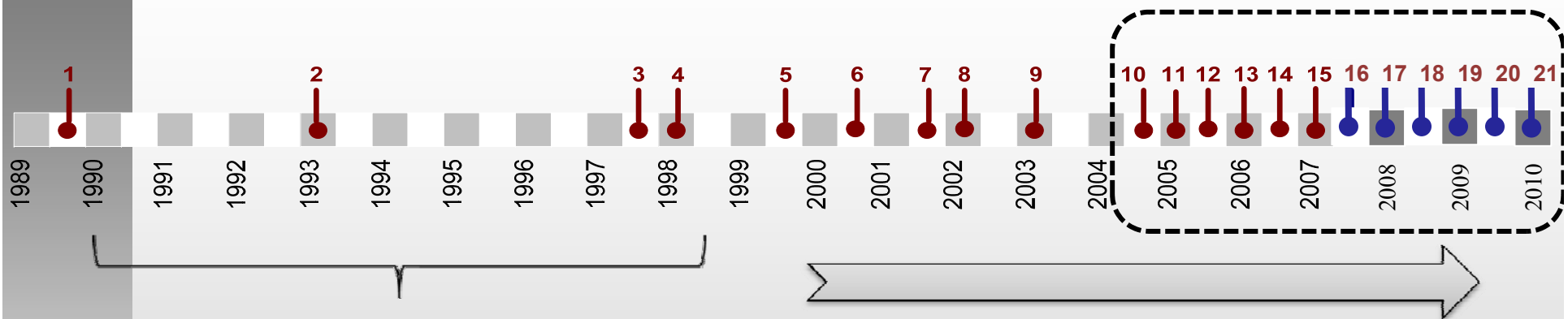


Policy-making

STI Governance

Policy-implementation

Supreme Council for Science and Technology

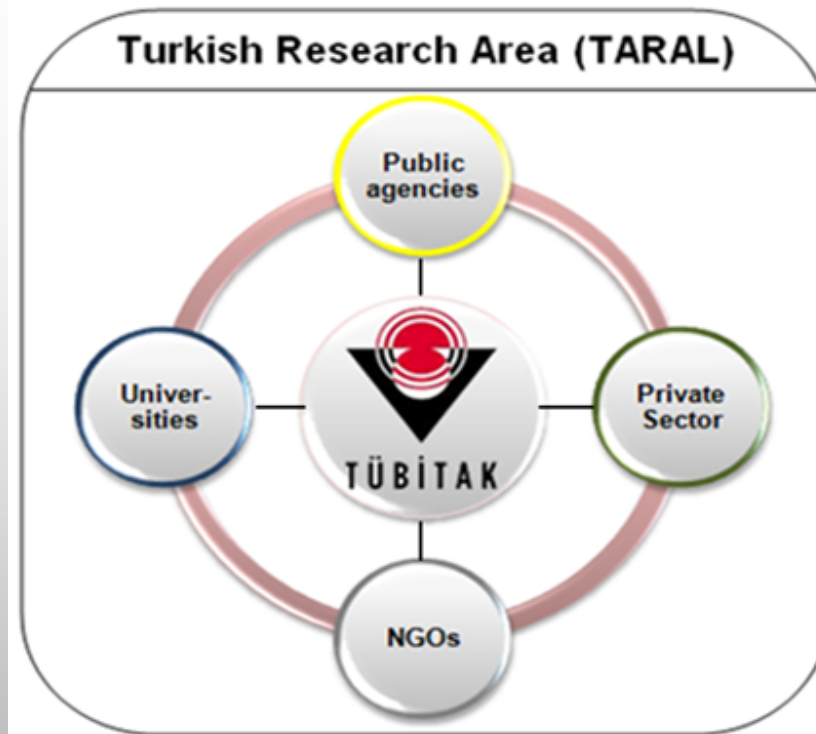


Resurrecting STI in Turkey - Milestones

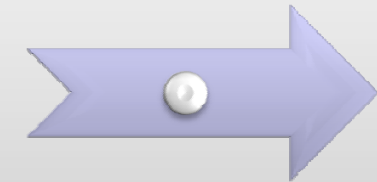
- Supreme Council for Science and Technology started to convene regularly.
- **Unity of jargon (OECD Frascati, Oslo and Canberra manuals have been adopted as references)**
- Strategic perspective, and concrete and motivating targets
 - Areas under the **Prime Minister's Initiative**
 - Developing Science and Technology Human Resources
 - Defense Research Program
 - Aerospace Research Program
 - Science and the Society Program
 - **Energy, Water and Food Strategies for 2011-2016**
- Devoting **financial resources** to this area
- Developing the necessary climate
 - Governance and legal infrastructure

National Science and Technology Initiative

Aims
Objectives
Principles
Priorities



TARAL Objectives



1

• To enhance **the quality of life**;

2

• **Find innovative solutions** to societal problems;

3

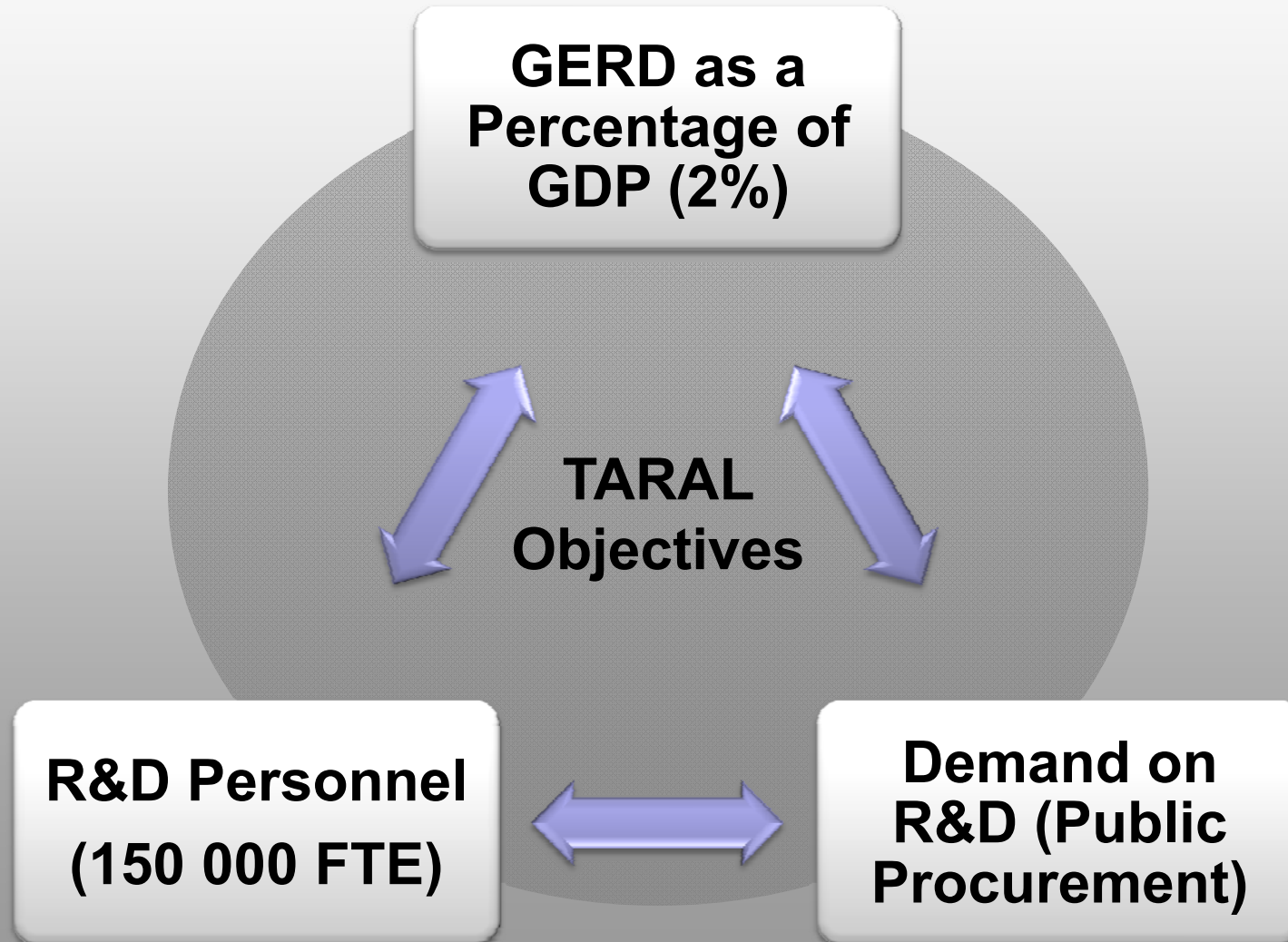
• Increase the **competitiveness** of the nation;

4

• Foster and diffuse S&T awareness in society.

Commitment for Concrete Targets (2013)

Shared National Vision and Consensus

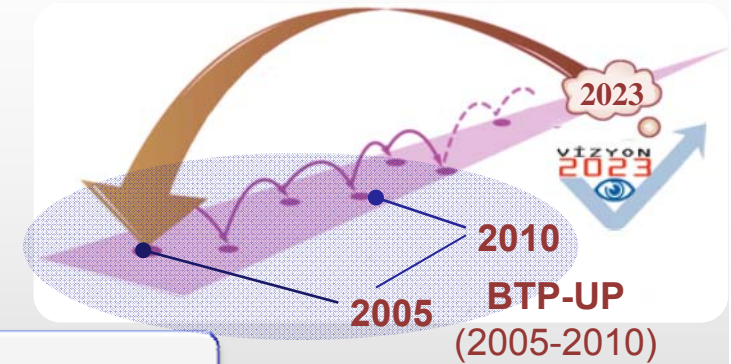


The TARAL targets provided **a stimulated environment for RDI** when combined with BTP-UP 2005-2010



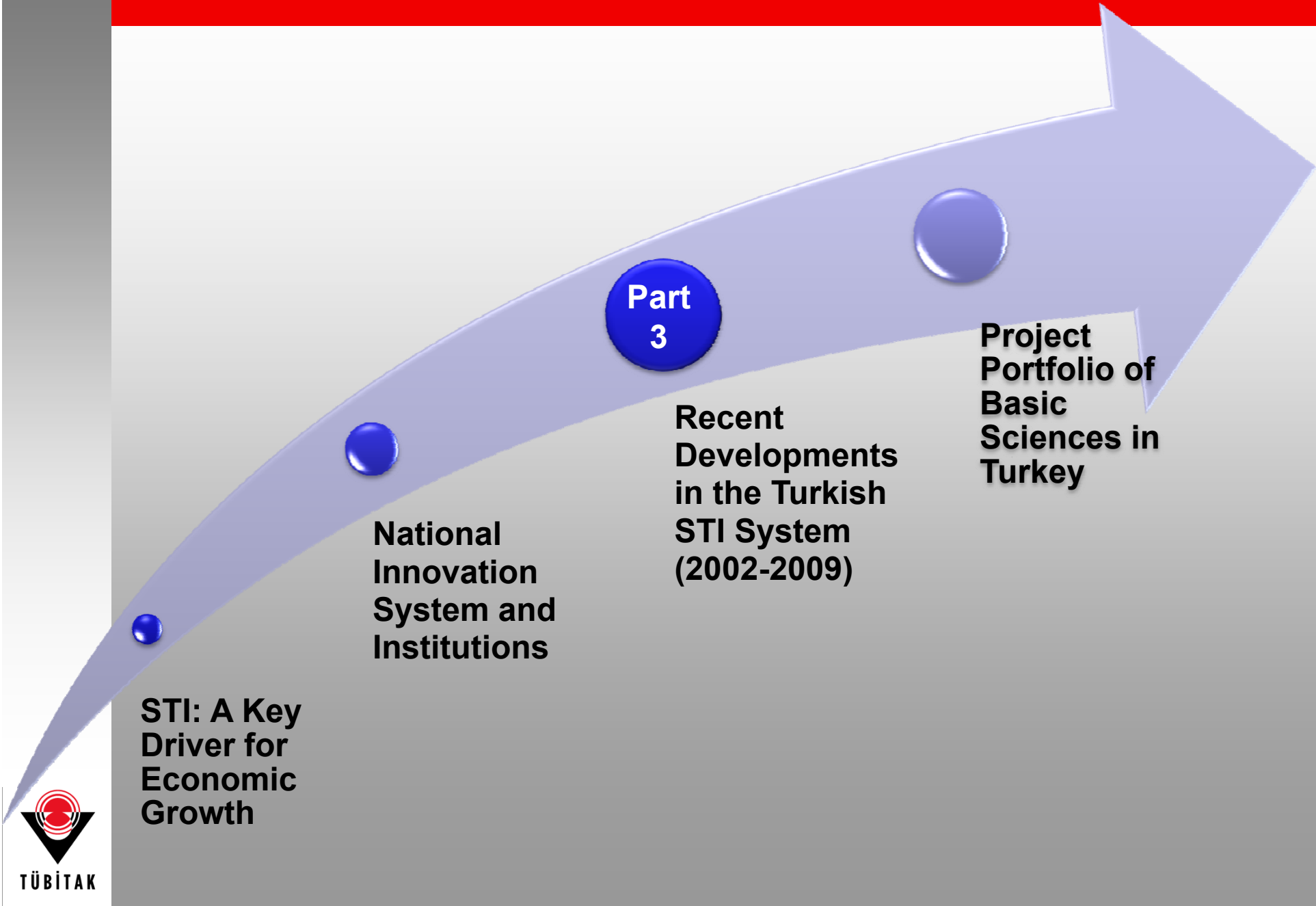
BTP-UP (2005-2010)

The first plan aimed to springboard the country towards the long-term aims for 2023 based on Vision 2023.



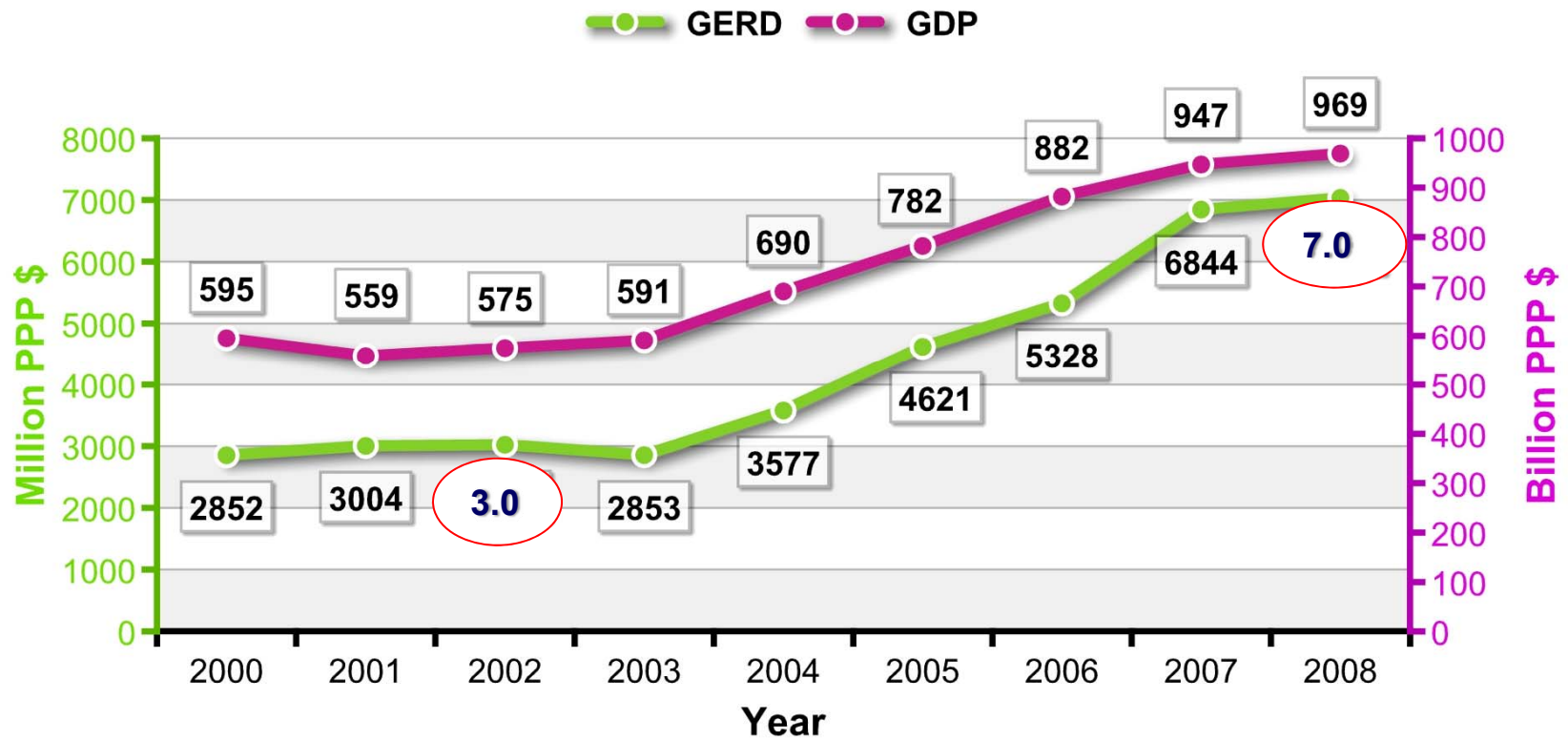
- 1 • Increase S&T awareness in society and improve STI culture
- 2 • Advance the quality and quantity of human resources for S&T
- 3 • Support high quality, result-oriented research
- 4 • Enhance the effectiveness of STI governance
- 5 • Boost the S&T performance of the private sector
- 6 • Improve the research climate and research infrastructure
- 7 • Further the effectiveness of national and international networks

Strategic Objectives



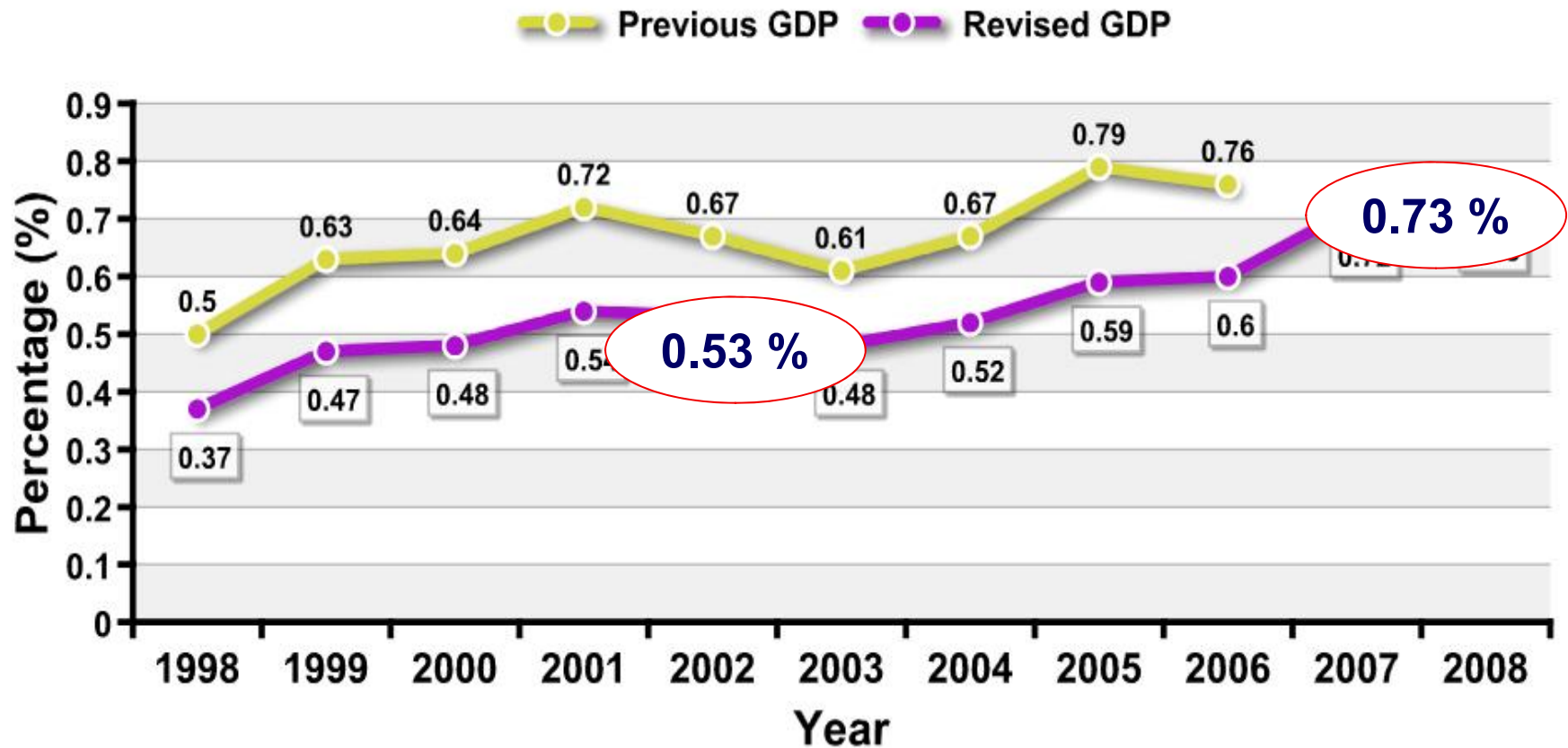
TÜBİTAK

R&D (GERD) Expenditures



Increased to 2.3 folds during 2002-2008

GERD as a Percentage of GDP



EU-27: % 1.76

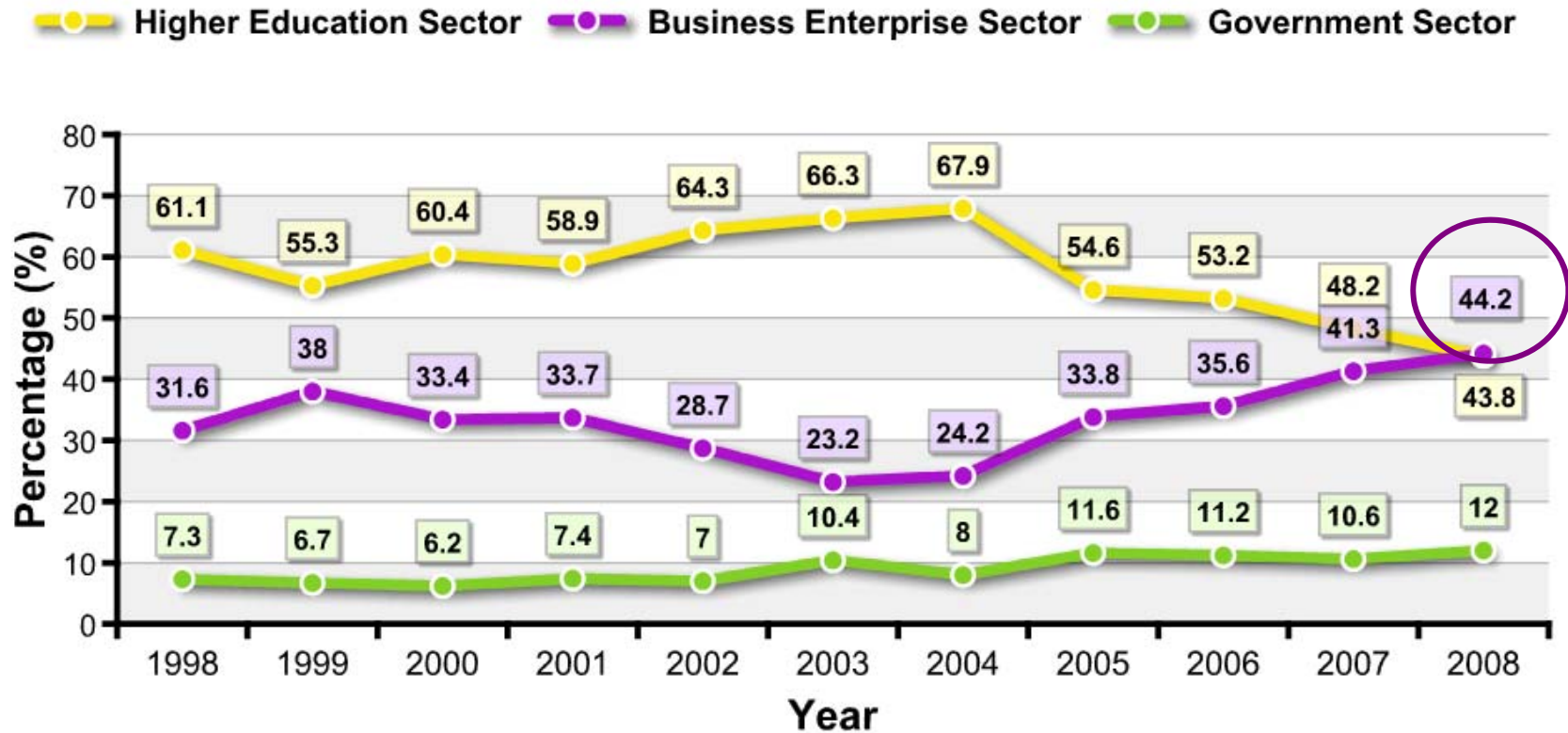
EU-15: % 1.88

Target 2% by 2013

Source: TurkStat

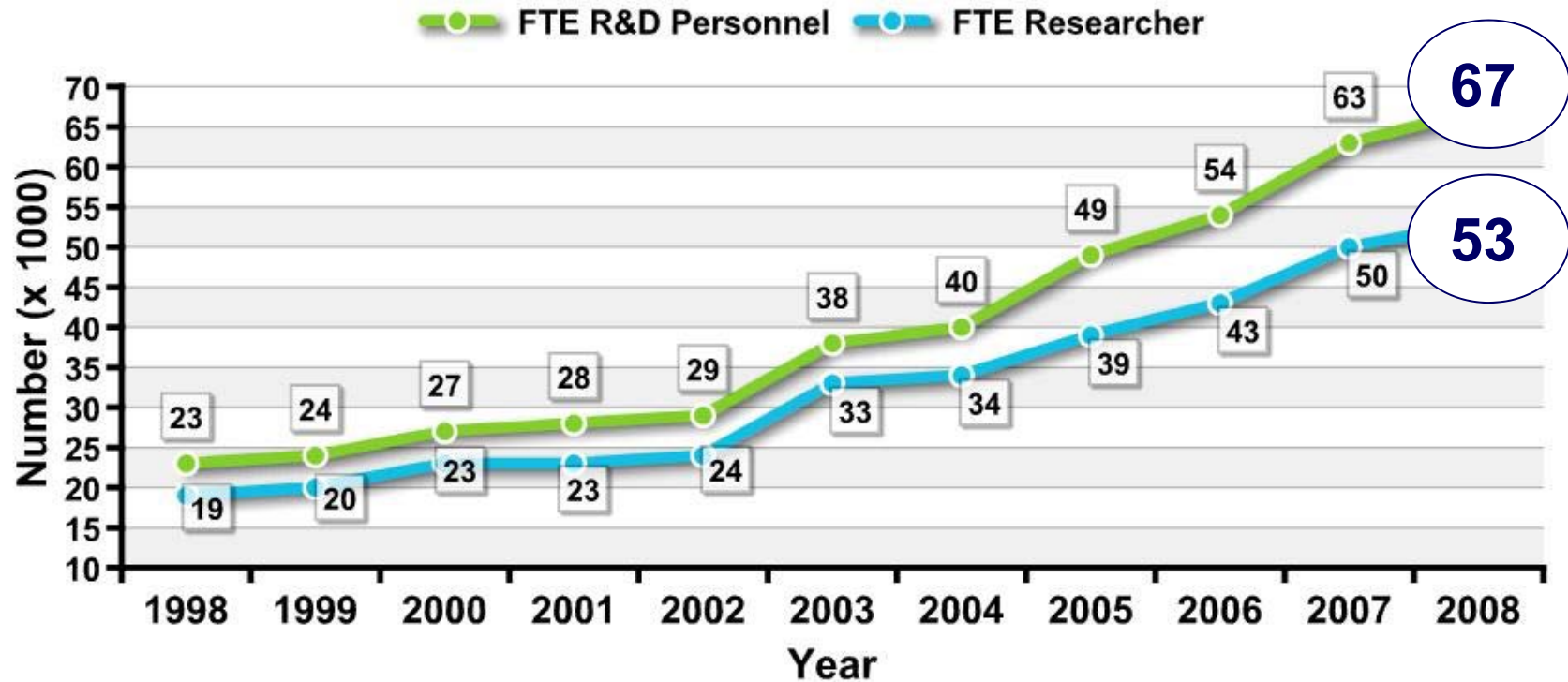
Note: Gross salaries are used for the calculation of R&D labor cost in higher education sector after the year 2006 for values based on revised GDP. (Revised GDP was announced on March 08, 2008 by TurkStat)

GERD by Sector of Performance



Share of business enterprise sector surpassed the other sectors for the first time in 2008

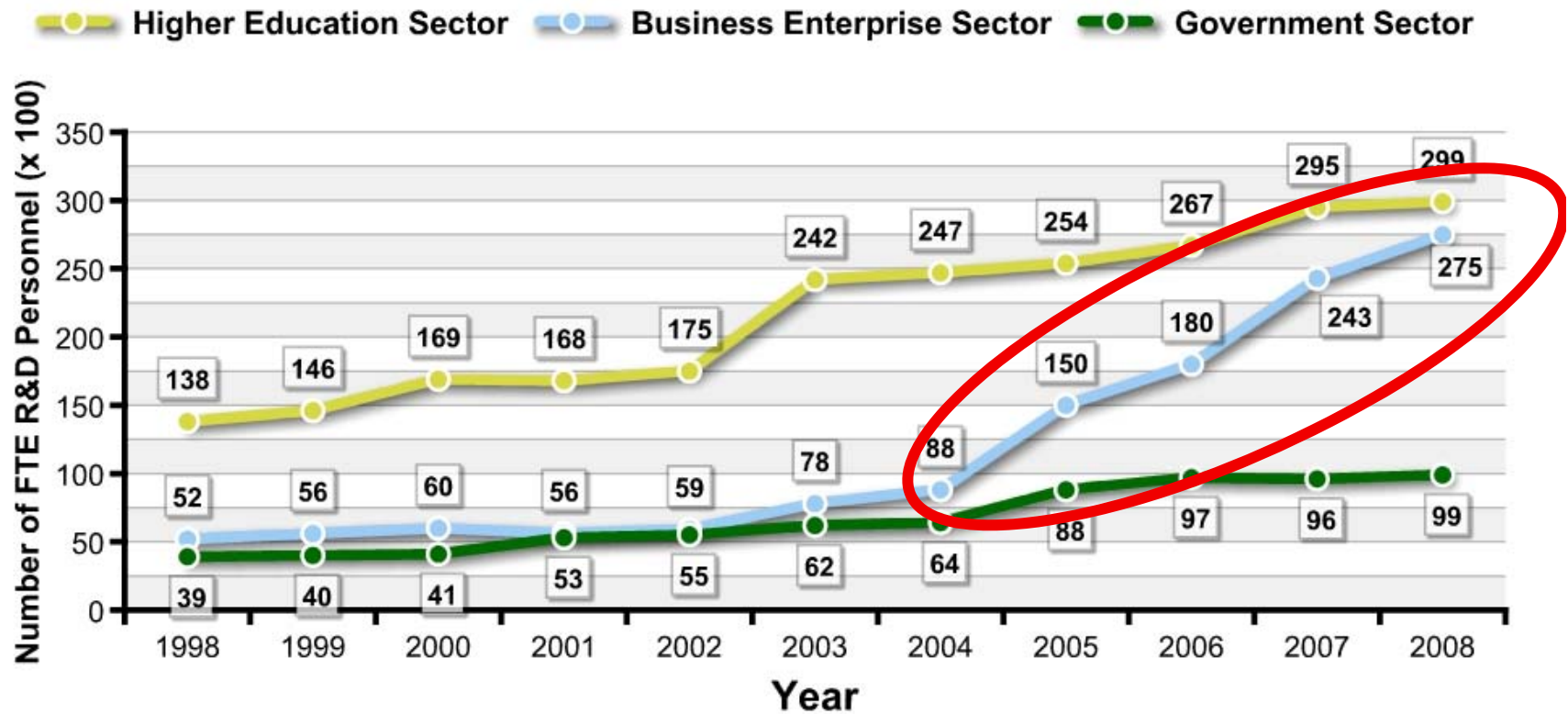
FTE R&D Personnel



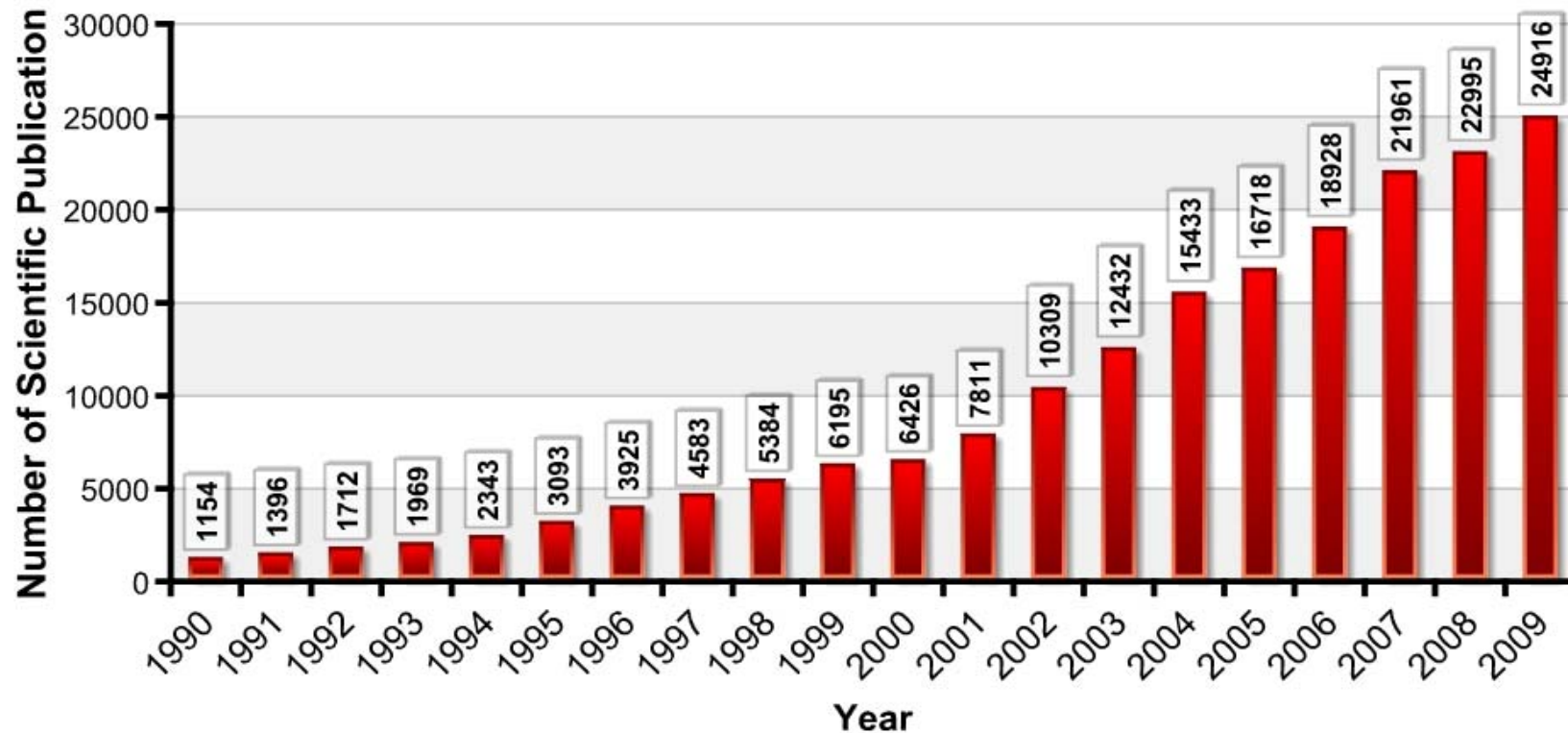
Increased to 2.3 fold during 2002-2008
TR Target 150 000 by 2013

FTE R&D Personnel

Number of FTE R&D Personnel by Sector of Employment

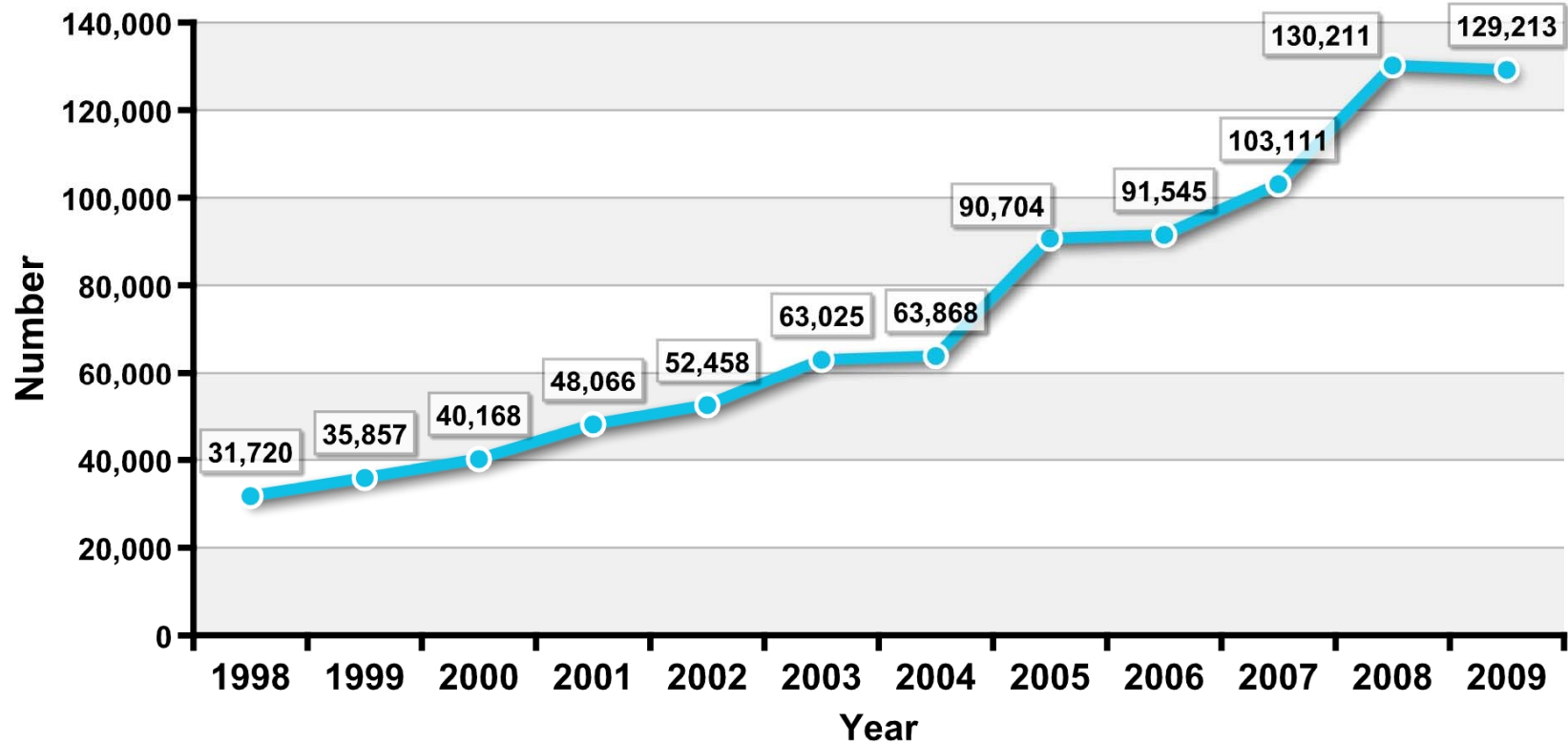


Scientific Publications



Increased to 2.4 folds during 2002-2009

Number of Citations Corresponding to Authors's Country as Turkey (Except Self Citations)



Increased to 2.5 folds during 2002-2009

From 2002 to 2007; Turkey Outpaced:



- Two countries regarding GERD (Finland, Denmark)



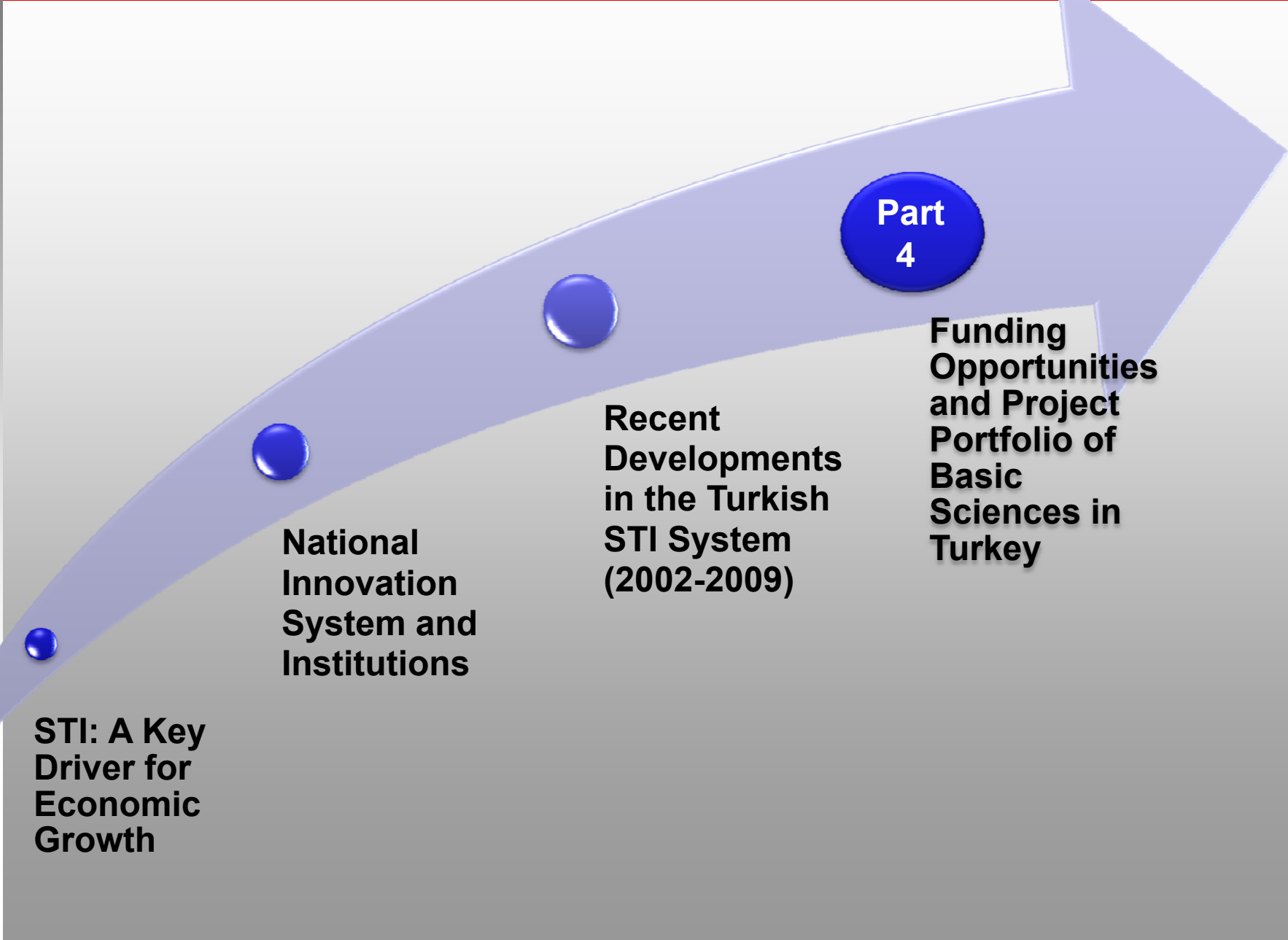
- Six countries regarding FTE R&D Personnel (Finland, Denmark, Belgium, Austria, Greece, Romania)



- Five countries regarding FTE Researchers (Finland, Denmark, Belgium, Austria, The Netherlands)



- Four countries regarding Scientific Publications (Belgium, Poland, Taiwan, Israel)



STI: A Key Driver for Economic Growth

National Innovation System and Institutions

Recent Developments in the Turkish STI System (2002-2009)

Part 4

Funding Opportunities and Project Portfolio of Basic Sciences in Turkey



TÜBİTAK-ARDEB Project Portfolio in Basic Sciences

Number of Proposed Projects					
	All Fields	Physics	Chemistry	Biology	Mathematics
2000-2004	5,902	171	430	497	14
2005-2009	22,428	960	1,688	1,400	181
Rate of Increase	3.8	<u>5.6</u>	3.9	2.8	12.9
Number of Supported Projects					
	All Fields	Physics	Chemistry	Biology	Mathematics
2000-2004	2,122	74	221	221	2
2005-2009	6,092	293	583	441	64
Rate of Increase	2.9	<u>4</u>	2.6	2	32
Total Budget of Supported Projects (Million TL)					
	All Fields	Physics	Chemistry	Biology	Mathematics
2000-2004	38.6	1.5	2.9	3.3	0.01
2005-2009	670.8	36.8	63.4	42.3	3.6
Rate of Increase	17.3	<u>2.5</u>	2.2	1.3	284

TÜBİTAK-ARDEB Project Portfolio in Basic Sciences

Success Rate (%)					
	All Fields	Physics	Chemistry	Biology	Mathematics
2000-2004	36	43	51	45	14
2005-2009	27	<u>31</u>	35	32	42

Number of Supported Projects

All Fields 3 folds

Physics 4 folds

Total Budget (Million TL)

All Fields 17 folds

Physics 2.5 folds

TÜBİTAK-BİDEB-Number of Supported Applicants

	All Fields	Physics	Chemistry	Biology	Mathematics
2000-2004	5,147	347	943	365	366
2005-2009	35,098	1,969	2,064	1,747	3,102
Rate of Increase	6.8	<u>5.7</u>	2.2	4.8	8.5

Scholarships

All Fields 6.8 folds

Physics 5.7 folds

TÜBİTAK Bilateral Cooperation Projects in Physics

Country	Number of Projects (2000-2004)
COST(ESF)	2
USA	4
Germany	3
Macedonia	2
Bulgaria	1
Greece	1
Hungary	1
Total	14

Country	Number of Projects (2005-2009)
COST(ESF)	6
USA	1
Germany	2
Italy	2
Russia	2
Ukrania	2
Belarus	1
China	1
Romania	1
Slovenia	1
Total	19

European Framework Programmes

**EU FP7 Programmes
Directly Related with Physics**

EU FP7 Marie Curie Programme

- Career Integration Grants
- Initial Training Networks
- Individual Fellowships

7 Projects in Physics

Project	Photonic Integration on Silicon Germanium
Period	2009 –2013 (<i>48 months</i>)
Awardee	Bilkent University – Dr. Ali Kemal Okyay

Project	Quantum Field Theory and Cosmology
Period	2010 – 2014 (<i>48 months</i>)
Awardee	KOÇ University – Dr. Emre Kahya

Project	Graphene Based Radio Frequency Electronics
Period	2010 – 2014 (<i>48 months</i>)
Awardee	Bilkent University – Dr. Coşkun Kocabaş

Project	Black Hole Universe
Period	2008 – 2012 (<i>48 months</i>)
Partner	Sabancı University

EU 7th FP Funded Individual Projects in Physics Panel: Marie Curie International Reintegration Grants - 2

Project	Novel Numerical Algorithms For Plasmonic Structures Embedded In A Layered Medium
Period	2010 – 2014 (<i>48 months</i>)
Awardee	Bahçeşehir University – Dr. Ergun Şimşek

Project	High-resolution and Robust Time Reversal Acoustics Using Vector Sensor Arrays
Period	2010 – 2014 (<i>48 months</i>)
Awardee	Bahçeşehir University– Dr. M. Berke Gür

EU 7th FP Funded Individual Projects in Physics Panel: Marie Curie International Reintegration Grants - 2

Project	Time-Domain Measurements of Phase Change Memory Switching Characteristics and Investigation of the Drift Mechanisms for the Threshold Voltage
Period	2010 – 2014 (<i>48 months</i>)
Awardee	Boğaziçi University – Prof. Özhan Özatay

Marie Curie 2011 Calls for Proposals

Calls	Deadline
Career Integration Grants (International Reintegration Grants)	8 March 2011 6 September 2011
Initial Training Networks	26 January 2011
Individual Fellowships (Intra European Fellowships)	11 August 2011

Marie Curie 2011 Calls Conference

23 September 2010 at TÜBİTAK premises

For further information please contact with
ncpmobility@tubitak.gov.tr

EU FP7 Programmes Directly Related with Physics

- **Cooperation Programme**
 - Interdisciplinary research
 - 0 project
- **Capacities Programme**
 - Research Infrastructures
 - 0 projects
- **Ideas(ERC) Programme**
 - Opportunities for Advanced Researchers
 - Opportunities for Young Researchers
 - 6 applications between 2007-2009
 - 0 projects

EU FP7 Research Infrastructures 8th Call

100M€ out of the total Call budget dedicated to
Integrating Activities composed of
23 topics including **7 topics for Physics**

- **Call Opens** : 20 July 2010
- **Call Closes** : 25 November 2010
- **Evaluation** : Dec 2010 – Feb 2011
- **First Contracts** : 2011 Fall
- **Call Budget** :159 M€

Integrating Activities Focusing Physics

- **Materials and Analytical Facilities**

1. Infrastructures for Neutron Scattering and Muon Spectroscopy
2. Synchrotron radiation sources and Free Electron Lasers
3. Laser sources

- **Physics and Astronomy**

1. Research Infrastructures for hadron physics: Studying the properties of nuclear matter at extreme conditions
2. Research Infrastructures for advanced radio astronomy
3. Research Infrastructures for optical/IR astronomy
4. Research Infrastructures for astroparticle physics: High energy cosmic rays, multi-messenger approach

Further details for Projects Funded :

http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=ri_projects_fp7

For additional info you can contact : ncpinfra@tubitak.gov.tr

2011 Ideas(ERC) Young Researchers Calls

- **Call publication date:** 20 July 2010
- **Call Closure dates:**
 - **14 October 2010 for Physical Sciences** and Engineering
 - 9 November 2010 for Life Sciences
 - 24 November 2010 for Social Sciences and Humanities
- **Call Budget: 660 million €**
- **“Starters”** : awarded PhD 2-7 years before
- **“Consolidators”**: awarded PhD 7-12 years before
- **Budget limit** for a project: max. **1.5 – 2 million €**
- **Project duration: 5 years**

2011 Ideas(ERC) Advanced Researchers Calls

- **Call publication date:** 2 November 2010
- **Call Closure dates:**
 - 9 February 2010 for Physical Sciences and Engineering
 - 10 March 2010 for Life Sciences
 - 6 April 2010 for Social Sciences and Humanities
- **Call Budget:** 661.4 million €
- **Other:**
 - Active researchers and to have a track-record of significant research achievements in the last 10 year
 - Budget limit for a project: max. 2.5 – 3.5 million €
 - Project duration: 5 years

Conclusion

National 2004 STI initiative and increase in the national and international funds for R&D and innovation boosted the scientific and innovative activities in the country and resulted in capacity development

Future Directions

- Continuing Investment in S&T
- Preparing New Strategies for 2011-2016
 - Science, Technology and Innovation Implementation Plan
 - STI Human Resources Development
- Continuing Efforts to Make Turkey a More Attractive Destination for Qualified Researchers
- Continuing Efforts to enhance Research Infrastructures
- Furthering proven demand side policies to address societal needs

Final Word

Beside the growth observed in national research capacity between 2005-2009, benefiting from the international collaborative research is also important.

Similar to the increase in national involvement in FP7 projects which are mostly interdisciplinary , this increment should be the case for physics because each of the other disciplines such as biology, chemistry, geology, material science, engineering and medicine deal with particular types of material systems that obey the laws of physics.*

**The Feynman Lectures on Physics Volume I. Feynman, Leighton and Sands*

Thank You