Turkish National Research & Innovation System and Addressing Grand Challenges

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Outline

1. National STI Targets and Key Figures

2. Recent Key Priorities of Turkish National STI System
   2.1. Mission Oriented Approaches
   2.2. Performance Based Approaches
   2.3. Supporting Skilled R&D Human Resources
   2.4. Supporting Entrepreneurship and Technology Transfer
   2.5. International Cooperation Activities
National Innovation System Targets For Economic Development and Wellbeing in 2023

- **GERD / GDP**: 3 %
- **BERD / GDP**: 2 %
- **Researchers (FTE)**: 300 K
- **Private Sector Researchers (FTE)**: 180 K

Every six months R&D policy of Turkey is reviewed in Supreme Council for Science and Technology chaired by the Prime Minister himself.
Many of the decrees adopted in SCST meetings involve universities

- Fostering R&D Start-ups and Spin-offs
- Enhancing TTOs
- Mini Entrepreneurship MBA Education
- University Entrepreneurship Index

- Open Video Courses For Higher Education
- Development of Centres of Excellence
- Improving Scholarships Supporting PhD Holders
- Development of University R&D Strategies

Examples: Resolutions of SCST Regarding the Ecosystem

- Enhancing TTOs
- MBA Education

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Significant Increase in Resources Allocated to RDI

• Based on an annual growth rate of 17%, R&D expenditures reached 13,5 billion $

• Private Sector (2013): 48 %

• Higher Education Sector (2013): 42 %

R&D Human Resources

Total FTE R&D Personnel
• 3 times increase since 2003

Public Sector
• 2 times increase since 2003

Private Sector
• 7.3 times increase since 2003

Higher Education Sector
• 1.8 times increase since 2003

Scientific Publications:
- 2.5 times increase since 2003

Patents:
- 11 times increase since 2003

*Source: TPI, TUBITAK ULAKBİM (2014)*
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2.1. Mission Oriented Approaches

National Science, Technology and Innovation Strategy (2011-2016)

Mission Oriented Programs and Call Based System

Technology Road Maps

1. Energy Efficiency
3. Pharmaceuticals
4. Vaccines
5. Biomedical Equipment
6. Medical Diagnose Kits
7. Biomaterials
8. MEMS/NEMS
9. Advanced Display Technologies
10. Machine Control and Factory Automation Systems
11. Embedded Software in Automotive and Machinery Sectors
12. Lightweight Materials Technology in Automotive
13. Social Sciences (Education, Economic Growth, Family, Urbanization, Culture, History)
Call Based Support Programs in Priority Areas

- **Industry Oriented RDI (1511)**
- **University Oriented RDI (1003)**
- **Public Challenges Oriented RDI (1007)**

**GÖKTÜRK - 2**
First High Resolution National Observation Satellite

**TÜRKSAT 6A**
First National Communication Satellite

**MİLRES**
National Wind Energy Power Plant

- **Domestic Electric Vehicle**
  Development of A Competitive, National Electric Vehicle

- **Biosimilar Pharmaceuticals**
  Domestic Biosimilar Medicines Produced via Biotechnological Methods
Addressing Grand Challenges in Need Oriented Areas

- National Energy R&D and Innovation Strategy
- National Water R&D and Innovation Strategy
- National Food R&D and Innovation Strategies

Actions and Initiatives for International R&D Cooperation

- Urbanization
- Poverty
- Energy
- Epidemic Diseases
- Demographic Change
- Water
- Climate Change
- Biodiversity
- Food Safety
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2.2. Performance Based Approaches

- Highest Quality Research
  - Award According to Project Performance
  - Incentives for Quality Oriented International Publications

- Higher Education
  - Project Overhead Increases According to the Performance
  - Entrepreneurial and Innovative University Index

- Research Centers
  - Centers of Excellence (1004)
  - Assessment of Higher Education Research Labs
Awards for Highest Quality Research

Project Performance Award

- Up to 200 K TL award for successfully completed projects
- Support increases due to performance!

Incentive Program for International Scientific Publications (UBYT)

- Up to 7,500 TL article support for researchers
- Incentive increases by folds due to quality!
- Each journal is assessed by objective criteria
Project Overhead Increases According to the Performance

- Project overhead will vary from university to university
- More performance more project overhead
- Calculations are based on objective criteria

Project overhead increases from 10% to 50%
Entrepreneurial and Innovative Universities

Entrepreneurial and Innovative University Index is developed in cooperation with 168 universities and 10 public institutions

Sample Indicators

- Number of firms established by academicians
- Number of firms established by students/graduated students
- Employment in those firms
- Patents
- Licences
- R&D and innovation projects
- Entrepreneurship, innovation lessons/trainings

Supporting Centers of Excellence

Support Program for Centers of Excellence (1004)

A new insight into specialization of Research Infrastructures in Turkey towards becoming Centers of Excellence

Infrastructure
Ministry of Development

Large Scaled Project Support
TÜBİTAK

Center of Excellence
Specialization

Qualified Thematic Research Centers

Consorsium:
• Center + Private Sector

Industry Stearing Board

Assessment of Higher Education Research Labs

Research Competency
Site Visit (%75) Management Competency
Site Visit (%25)

Competency Evaluation Report

• Expert notes
• Evaluation Grade
• Feedbacks

Monitoring and Proficiency Assessment Committee

Research Infrastructures Board

Research Competency Criteria
- Infrastructure Size and Human Resources
- Scientific Production and Academic Appeal
- Cooperation and Interaction
- Technological Production and Economic Contribution
- Education, External Use and Diffusion

Management Competency Criteria
- Leadership and Strategic Management
- Human Resources Management
- Project Management
- Process and Quality Management
- Results Relating to Users

Program for Centers of Excellence (1004)
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2.3. Supporting Skilled R&D Human Resources


Vision
To make Turkey highly competitive and a “center of attraction” in the international arena in terms of science and technology human resources

10th Development Plan
Attracting Qualified Human Resources Program

Each year almost 20k scientists are supported within 29 different programs

National Scholarships

- Supported Scientists
  2000-2011 (yearly av.): 1,967
  2012-2014 (yearly av.): 3,837

Mobilization and Brain Gain Scholarships

- Inbound Scientists
  2000-2011 (yearly av.): 161
  2012-2014 (yearly av.): 435

- Outbound Scientists
  2000-2011 (yearly av.): 748
  2012-2014 (yearly av.): 1,335

Thematic Scholarships

- Prioritized Areas
  - Natural Sciences
  - Social Sciences
  - Industry Based
Revision of Education System

New Curricula

Digital Education Contents

Education Materials

2500 Animations

649 Videos
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Individual Entrepreneurs (1512) 
BİGG.tubitak.gov.tr

Supporting entrepreneurship and creations of R&D based start-ups

Venture Capital Support Program (1514)

R&D Start-Up Support

Technology Transfer Office Support Program (1513)

34 universities between 2013-2015
10 M TL for 10 years for each university

University Entrepreneurship Sertificate Program (1601)

Supporting the development of entrepreneurship and R&D culture
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2.5. International Cooperation

International Bilateral and Multilateral Relations

- 31 institutions from 22 countries

Participation at Horizon 2020

- National Coordination Office
2.5. International Cooperation Activities

**Turkish Scientists Abroad Conference**
- Turkish scientists from all over the world

**Destination Turkey» Workshops**
- 742 researchers returned since 2007
- 2012-2013: 12 Workshops in the USA and Canada
- 2014: Germany
- 2015: USA

**Year of Science» Collaborations**
- New mechanism for fostering international collaboration
- 2014 Turkish-German Year of Science
- 2015 Turkey-UK Year of Science and Innovation

**The Leadership Academy**
- Meeting of executives and directors from the Balkans, Central Asia and Africa
In today’s highly globalized world, all challenges concern each and every one of us.

Collaboration is the key!

Thank you