Eugenijus Butkus, Prof.

*Research Council of Lithuania, Chairman*

International Conference for the Central and Eastern Europe, Balkans, Caucasus and Baltic States on SCIENCE AND EDUCATION POLICIES
18-21 September 2008, Moldova, Chișinău
Lithuanian R&D capacity is concentrated in higher education and research institutions

Lithuanian R&D system consists of:

- 15 State Universities
- 24 colleges
- 17 State Research Institutes
- 18 University Research Institutes

- *University research institutes* carry out research of high international quality. They focus mainly on basic research and provide the research basis for university education and for doctoral studies.
- *State research institutes* established to carry out long-term research of international quality important for the Lithuanian economy and culture and for international cooperation.
Lithuania’s number of publications and citations
(Thomson ISI, includes 25 Lithuanian journals)
Number of publications, comparison of Estonia, Lithuania and Latvia (per 1 M population)

- **Lithuania**: 259 (2005 m.), 323 (2006 m.)
- **Estonia**: 555 (2005 m.), 504 (2006 m.)
- **Latvia**: 133 (2005 m.), 107 (2006 m.)
PhD degrees in Nordic and Baltic countries, (per 1 M population) in 2006
Participation in FP6
The Science Council of Lithuania is the scientific adviser and consultant to the Seimas (Parliament) and the Government on strategic issues of research and higher education.

The role is changing, amendment to the law was made Sept. 2007

Transformation of the Science Council into Research Council
Structure of the Research Council

Selection Commissions appointed by the Prime Minister: one Commission to select members of the Humanities and Social Sciences Committee and the second to select members of Natural and Technical Sciences Committee.

Committee on Humanities and Social Sciences
10 members and Chair

Committee on Natural and Technical Sciences
10 members and Chair

Board (9 members)

Administration (Executive Agency)
Knowledge-based Economy

**Education system** that ensures that citizens are equipped to obtain, use, and share knowledge

**Innovation system** that bring together researchers and businesses in commercial applications of science and technology

An **information society infrastructure** that gives all people access to affordable and effective information and communications
The classical innovation system

The concept of serendipitous unfettered research was believed to be the innovation motor (Vanever Bush, Science: The Endless Frontier. A leading figure in the development of the military funding of science, a pioneering concept for the World Wide Web).

Today this is no longer the case. Even the industrial epoch is coming to an end.

Thus we need reforms of the science – university system in order to support societal development.
A new paradigm

Donald Stokes\textsuperscript{1} has analyzed the scientific literature and parametrized it in novel ways

<table>
<thead>
<tr>
<th>Fundamentally understood</th>
<th>Use inspired</th>
</tr>
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<tbody>
<tr>
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<td>yes</td>
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<table>
<thead>
<tr>
<th>Pure basic research (Bohr)</th>
<th>Use-inspired research (Pasteur)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure applied research (Edison)</td>
<td></td>
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RESEARCH PARADIGMS

**Old paradigm** (Linear model)

BASIC RESEARCH → APPLIED RESEARCH → DEVELOPMENT

**New paradigm** (Concurrent model)

SOCIETAL & BUSINESS CHALLENGES

DEMAND

→ Basic research

→ Applied research

→ Development

SCIENTIFIC UNDERSTANDING

PROBLEM SOLVING BUSINESS OPTIONS

TECHNOLOGICAL SOLUTIONS

MARKET

Dr. Heikki Kotilainen, Deputy Director General Tekes, the National Technology Agency, Finland
## KEI Indexes (2007 World Bank, KAM)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>KEI</th>
<th>Economic Incentive Regime</th>
<th>Innovation</th>
<th>Education</th>
<th>ICT</th>
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**KAM - Knowledge Assessment Methodology**

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<tr>
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<td>6.89</td>
<td>8.11</td>
<td>6.87</td>
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</table>
Lithuania’s R&D evaluation organized by the Research Council of Norway (1995)

World bank study *Lithuania. Aiming for a knowledge Economy, 2003*
Recommendations of the Science Council of Lithuania to implement the WB proposals, *June 2004*
Science Council of Lithuania & the Board on Science, Technology, and Economic Policy U.S. National Academy of Sciences

Innovation for Growth and Employment: The Role of the Innovative University

Bradley Knox, Small Business Committee, U.S. House of Representatives
James Turner, Science Committee, U.S. House of Representatives
Dr Heikki Kotilainen, Deputy Director General, Tekes Finland
Dr Charles Wessner, U.S. National Academy of Sciences
The effective functioning of Lithuania’s innovation system is constrained by a large disconnect between enterprises and the R&D community, an overemphasis on public-sector-driven R&D, brain drain, and outdated funding approaches.

Enterprises are the drivers of innovation. However, Lithuanian enterprises spend only 12 percent of Lithuania’s total expenditures (0.8% GDP in 2007) on R&D compared to ca 50 percent of GDP for the EU on average.

Lithuanian Technology foresight completed in 2007. This allows to identify prospective fields of technological development and take measures to achieve progress in these fields.

A process for the establishing of the Science Centers (Valleys) is under way.
Most Competitive Sectors of Lithuanian Economy in Long Term

Telecommunications and information technologies
Biotechnology, Pharmacy and Laser technology
Transportation, construction and logistics
Fertilisers and chemicals
Machinery and electrical equipment's production
Foodstuffs and beverages
Textile and clothing
Wood processing and furniture manufacturing
Refined oil production
Science Centers (*Valleys*) include a combination of research, business and higher education set in one place.

At present five *Valleys* programmes are under evaluation. Integration of Universities, research institutes, and business are in progress.
Decision of the Government for the programming period 2007-2013: 10% of the European Union Structural funds allocated to R&D

Operational programmes:
Research and Development for Competitiveness and Growth of the Economy
Development of Human Resources

Funding, including the Structural funds for R&D will be allocated according to the priorities to link needs of economy and research.

The Science Council will administrate Human resources programs: young and senior researchers grants (global grant scheme), postdoc, PhD and students research projects
## Operational programme for the Development of Human Resources

<table>
<thead>
<tr>
<th>Priorities</th>
<th>Measures</th>
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<tbody>
<tr>
<td>Strengthening researchers’ abilities</td>
<td>Researchers’ Career Program (Global Grant Scheme)</td>
</tr>
<tr>
<td></td>
<td>Grants to the internationally recognized researchers</td>
</tr>
<tr>
<td></td>
<td>Grants to young researchers starting independent career</td>
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<tr>
<td></td>
<td>Reintegration grants to the researchers working abroad to start the career</td>
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<tr>
<td></td>
<td>Post-docs projects Short-term visit of researchers</td>
</tr>
<tr>
<td>Centers of Excellence</td>
<td>Development of high level research and competence centers</td>
</tr>
</tbody>
</table>

*Total: 120,234,000 Lt*

Max grant 110 k€/year. Duration 2-3 years
National Research Programmes (NRP) designed by the Science Council

NRP is designed to encourage pursuit of a diverse agenda of research topics aimed at providing new knowledge and insights into varied and complex problems for economical and societal needs

- Bottom-up approach for National Research Programmes
  *ca 140 topics suggested*
- First round: grouping and matching the research areas
- Second round: formulation of programmes
1. Nation and state: heritage and identity
2. Social challenges and national security
3. Ecosystems in Lithuania: climate changes and human impact
4. Chronic non-infectious diseases
5. Sustainable and renewable energy
Action plan

- Formulation and Coordinating Research and Innovation Policy: Science, Technology and Innovation Commission chaired by the Prime Minister
- Tax incentives:
  - Expenditures for R&D reduce taxable income 3 times
  - Amortization process is reduced to 2 years
  - Tax relief for investment in new technologies up to 12% (under preparation)
- Increasing RD linkages between research institutions and companies to meet needs of the economy
- Funding R&D: move to competitive, program funding
Thank you