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WORKSHOP:
GLOBAL NETWORKING: SHAPING THE FUTURE TOGETHER

THE PLACE OF THE EU IN A MULTIPOLAR WORLD OF S&T

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THE ROLE OF RESEARCH AND INNOVATION

Science, education and innovation are pillars of economic growth and job creation

Research and Innovation are at the heart of the European Union`s EUROPE 2020 Initiative

Today`s economic situation is particularly difficult. In times of crisis, major demographic changes and increasing global competition, Europe`s competitiveness, the capacity to create new jobs and our future standard of living depends on our ability to drive innovation in products, services, business and social processes and models.

Research and innovation are also essential in tackling major societal challenges such as climate change, energy and resource scarcity, health and ageing

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THE PLACE OF EU IN A MULTI POLAR WORLD OF S&T

According to the STC key figures report 2008/2009:

80% of researchers work outside the EU

75% of GERD is executed in other parts of the world

69% of patent applications are made outside the EU

EU`s world share in GERD has diminished by 7.6% over the previous 6 years

EU`s world share of patent application has declined 14.2% over the previous 6 years

While the ratio of the world share of patent applications/world share of GERD declined in the EU by 7%, it increased in the emerging economies of Asia by 53%

Conclusion: Asian economies have increased their patents even more rapidly

than their investments in research when compared with the EU

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THE PLACE OF EU IN A MULTI POLAR WORLD OF S&T- FUNDING

EU is lagging behind the US, Japan and South Korea in terms of overall R&D intensity, due to the lower level of R&D funded and performed by the business sector

2006	2000
JAPAN TOTAL 3.39 PRIVATE 2.62	JAPAN TOTAL 3.04 PRIVATE 2.20
S. KOREA TOTAL 3.23 PRIVATE 2.43	S. KOREA TOTAL 2.39 PRIVATE 1.73
US TOTAL 2.61 PRIVATE 1.69	US TOTAL 2.73 PRIVATE 1.90
EU-27 TOTAL 1.83 PRIVATE 1.00	EU-27 TOTAL 1.86 PRIVATE 1.05
CHINA TOTAL 1.42 PRIVATE 0.98	CHINA TOTAL 0.90 PRIVATE 0.52

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THE PLACE OF EU IN A MULTI POLAR WORLD OF S&T- RESEARCHERS

Since 2000 China has doubled its number of researchers and the number of researchers has grown twice as fast in the EU as in the US and Japan

2006

EU-27 1.33 million researchers

US TOTAL 1.39 million researchers

CHINA 1.22 million researchers

A sizeable increase in the number of researchers was observed between 2000 to 2006 – in China 9.9% per annum and in South Korea 10.5% per annum – when compared to EU-27 3.1% per annum, Japan 1.5 % per annum and US 1.5% per annum.

THE PLACE OF EU IN A MULTI POLAR WORLD OF S&T- PUBLICATIONS

In 2006, EU-27 remained the largest producer of scientific publications in the world (EU 37% US 31%).

However the EU contributes less than the US to high impact publications (US 1.45% EU 0.97% - contribution to the 10% most cited publications)

China`s share of world scientific publications has more than doubled within six years and is now larger than that of the Japanese

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THE PLACE OF EU IN A MULTI POLAR WORLD OF S&T- INDUSTRIAL RESEARCH

According to the 2009 EU Industrial R&D investment Scoreboard:

Among the top 50 R&D investors, the EU and the US account respectively for 16 and 18 companies (for both, 2 less than the previous year) and Japan for 13 (4 more than the previous year)

In the list of top 10 R&D investors, Toyota Motors took the first place. The US still has five companies (Microsoft, General Motors, Pfizer, Johnson & Johnson and Ford Motors). The EU has two companies Volkswagen and Nokia. The other two companies are from Switzerland: Roche and Novartis.

The companies in the EU top 50 are mainly from the Automotive (11), Pharmaceuticals (7) and IT-sectors (7) while the non-EU top 50 are mainly IT-related (20) or in the Pharmaceuticals and Biotechnology (13) sectors

Companies in the energy field also saw a sharp rise in R&D.

Companies based in emerging economies continued to show the highest R&D growth, led by China with a 40% increase, India 27.3%, Taiwan 25.1% and Brazil 18.6%.

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THE S&T PANORAMA IN THE DIFFERENT M.S.- R&D EXPENDITURE

Although there has been little development in R&D intensity at EU-27 level, R&D expenditure grew in real terms in all M. S. between 2000 and 2006 at varying rates, ranging from near 0.0% in the Netherlands and 3.4% in Belgium to 211% in Estonia.

The total real growth of R&D expenditure between 2000 and 2006 exceeds 100% in the Baltic States and in Cyprus.

It was greater than 60% in Hungary, Romania, the Czech Republic, Ireland and Spain.

The EU average real growth in R&D expenditure between 2000 and 2006 was 14.8%.

Portugal is slightly higher than the EU average (16.3%). UK (11.9%), Germany (9.3%), Italy (9.0%) and France (8.2%) are below the EU average.

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THE S&T PANORAMA IN THE DIFFERENT M.S.- R&D INTENSITY

R&D intensity increased in 17 M. S., in particular in the less R&D intensive M.S. between 2000 and 2006. R&D did not increase in the UK, France and Italy and increased only slightly in Germany.

The stability of EU-27 R&D intensity disguises quite different situations across M. S. and the Associated States. M.S. and A.S. can be divided into 4 groups according to the level of R&D intensity:

- **Finland, Sweden, Denmark, Austria and Germany (R&D intensity higher than 2.4%)**
- **France, Belgium and UK (between 1.7 and 2)**
- **Netherlands, Slovenia, Czech Republic, Luxembourg, Ireland, Spain, Estonia, Italy and Hungary (1% to 1.7%)**
- **Portugal, Lithuania, Latvia, Greece, Poland, Malta, Bulgaria, Slovakia, Romania and Cyprus (less than 1%)**

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THE S&T PANORAMA IN THE DIFFERENT M.S.- RESEARCHERS

EU-27 has 5.1 Scientists and engineers as % of labour force. However the situation varies across the M.S. with Belgium, Ireland, Finland, Sweden, Denmark, Netherlands, German with values from 8.0 and 6.0 and Bulgaria, Portugal and Slovakia around 3

R&D personnel account for 1.45% of total employment in EU 27. Proportions are high in Finland , Sweden, Luxembourg, Denmark and Norway (between 3.22 and 2.44).

In Latvia, Malta, Portugal, Poland, Cyprus, Bulgaria and Romania the R&D personnel accounts for less than 1% of the total employment

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THE S&T PANORAMA IN THE DIFFERENT M.S.- TRAINING OF RESEARCHERS

The EU has produced more tertiary graduates and doctoral graduates than the US and Japan since 2000. Furthermore, the growth rates in the numbers of tertiary graduates and doctoral graduates were much higher in the EU than in the US.

In 2005, 1,000,000 doctoral degrees were awarded in EU-27 compared to 53,000 in the Us and 15,000 in Japan.

The Nordic countries have, in general, achieved the highest growth rates for graduates, science and technology professionals, R&D personnel and researchers.

The share of population with tertiary education has increased in all EU countries

The share of adults that achieved a tertiary level of education is 22.9% in the EU. The share ranges from 33% in Finland and Denmark to 13% in Italy, Malta, Romania and Portugal and the Czech Republic.

Finland, Germany and Portugal have the highest share of doctoral graduates in the population aged 25-34 (Value higher than 2.5). Closely followed by Sweden, Austria and the UK (ratio 2 or higher) The EU-27 average is 1.4.

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THE S&T PANORAMA IN THE DIFFERENT M.S.- RESEARCHERS IN THE PRIVATE SECTOR

EU-27 has a lower share of business researchers (49%) than the US (79%) and Japan (68%).

Within the EU-27, the share of researchers employed in the business sector ranges from 10.9% in Lithuania to 73.9% in Luxembourg.

M.S. above the level of 60% are Denmark, Germany, Luxembourg, the Netherlands, Austria and Sweden.

Countries below 30% are Bulgaria, Estonia, Greece, Cyprus, Latvia, Lithuania, Poland, Portugal and Slovakia.

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THE S&T PANORAMA IN THE DIFFERENT M.S.- S&T OUTPUTS

Countries like Sweden, Denmark, Finland, the Netherlands, UK, Belgium, Austria, Ireland have a high scientific publications in relation to pubic expenditure on R&D

The highest number of patent application per million of population is found in Germany, followed by Finland, Luxembourg, Sweden, Netherlands, Denmark, Austria, Belgium, France, UK. The lowest numbers can be found in Portugal, Lithuania, Latvia, Slovakia, Poland, Bulgaria, and Romania.

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THE S&T PANORAMA IN THE DIFFERENT M.S.- INDUSTRIAL RESEARCH

In the Top 10 Companies by R&D investment , the profile of companies varies across the M.S.

Germany = automotive and chemical industry
Finland = telecommunications
Denmark = energy
France = automotive, telecommunications, energy
Sweden = automotive, telecommunications, energy
Netherlands = aerospace, electronics
UK = Pharmaceutical, telecommunications, chemical industry, energy
Spain = telecommunications, energy, automotive
Portugal = Banking, Construction, Biotechnology, energy

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THE IMPORTANCE OF THE EUROPEAN RESEARCH PROGRAMMES

The current European Framework Programme of research and development, with 52 Million Euros of funding, has an enormous strategic importance for the development of innovation, competitiveness and therefore employment of the European area.

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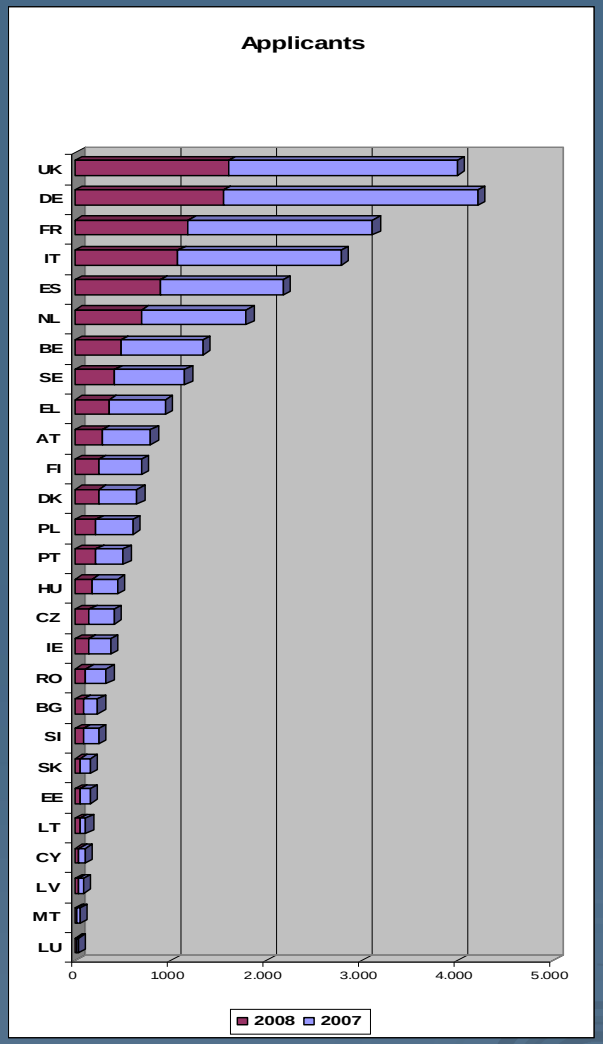
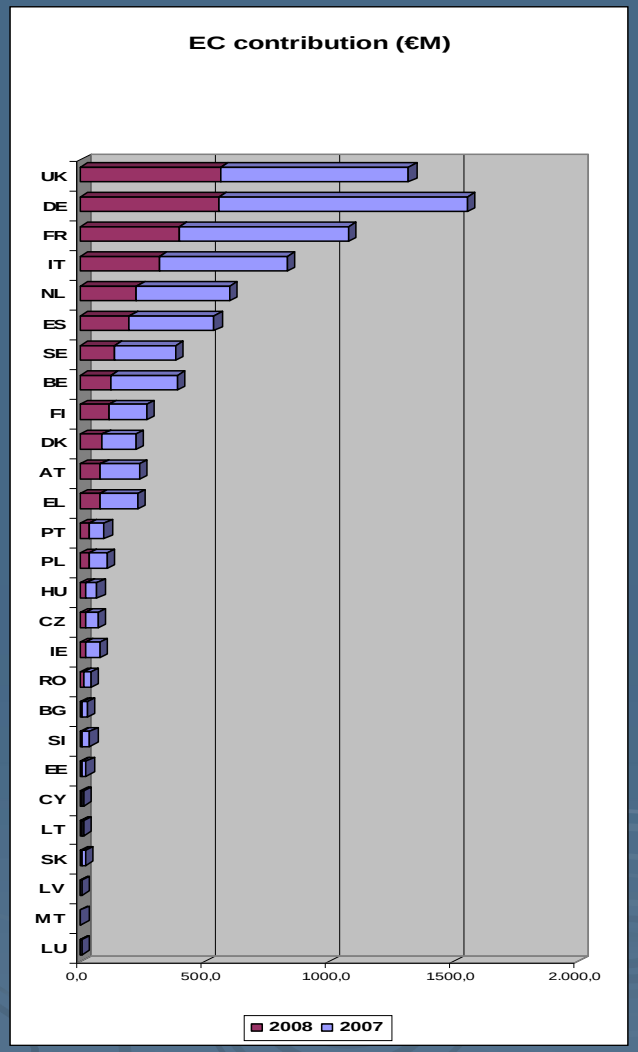
THE PARTICIPATION OF THE DIFFERENT M.S. IN THE EUROPEAN RESEARCH PROGRAMMES





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THE STRENGHS OF THE EU RESEARCH AND INNOVATION SYSTEMS

We have world leading researchers, entrepreneurs and companies

We have unique strength in our values, traditions, creativity and diversity

We have created the largest internal market in the world

European societies and civil society are actively engaged in emerging and developing economies around the world

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THE CHALLENGES OF THE EU RESEARCH AND INNOVATION SYSTEMS

We have to tackle our weaknesses:

- **Under-investment in our knowledge foundation**
- **Unsatisfactory framework conditions, ranging from poor access to finance, high costs of IPR to slow standardisation and ineffective use of public procurement**
- **Too much fragmentation and costly duplication**
- **Too much bureaucracy and red tape**

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THE FUTURE OF EU RESEARCH AND INNOVATION SYSTEMS

We must build on our strengths and tackle our weaknesses.

Europe should continue to invest in research, open up the research systems and promote free circulation of researchers, increase competition, and promote excellence

In order to increase the knowledge intensity of the EU economy, the European research system must pursue the commercial application of the results of scientific research. This requires better cooperation between academia and business in a system of open innovation and the capacity to exploit research within high-tech, innovative SMEs.

Furthermore, European research systems should be more efficient and more effective in order to ensure a better return on investment.

We can and must do much better. Underlying all these reforms is the need to simplify.

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Develop effective and close cooperation between universities and industry

- **Cooperation between universities and industry need to be intensified at national and regional level, as well as geared more effectively towards innovation, the start-up of new companies and, more generally, the transfer and dissemination of knowledge.**

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The Modernization agenda

- **Autonomy and accountability**
  - **New governance systems based on strategic priorities**
  - **Overcome internal fragmentation**
- **Promote partnership with the business community**
- **Provide the right mix of skills for the labour market**
  - **Employability**
  - **Entrepreneurial mindset**
  - **Life Long Learning**

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The Modernization agenda

- **Reduce the funding gap**
  - **Rethink the mix of tuition fees and support schemes (equal access doesn't imply equity)**
  - **Focus funding on outputs rather than inputs**
  - **Differentiate funding sources**
- **Enhance interdisciplinarity**
  - **Focus on grand challenges or broad domains**
- **Interaction with society**
  - **Involvement of stakeholders in governance**
  - **Better communication**

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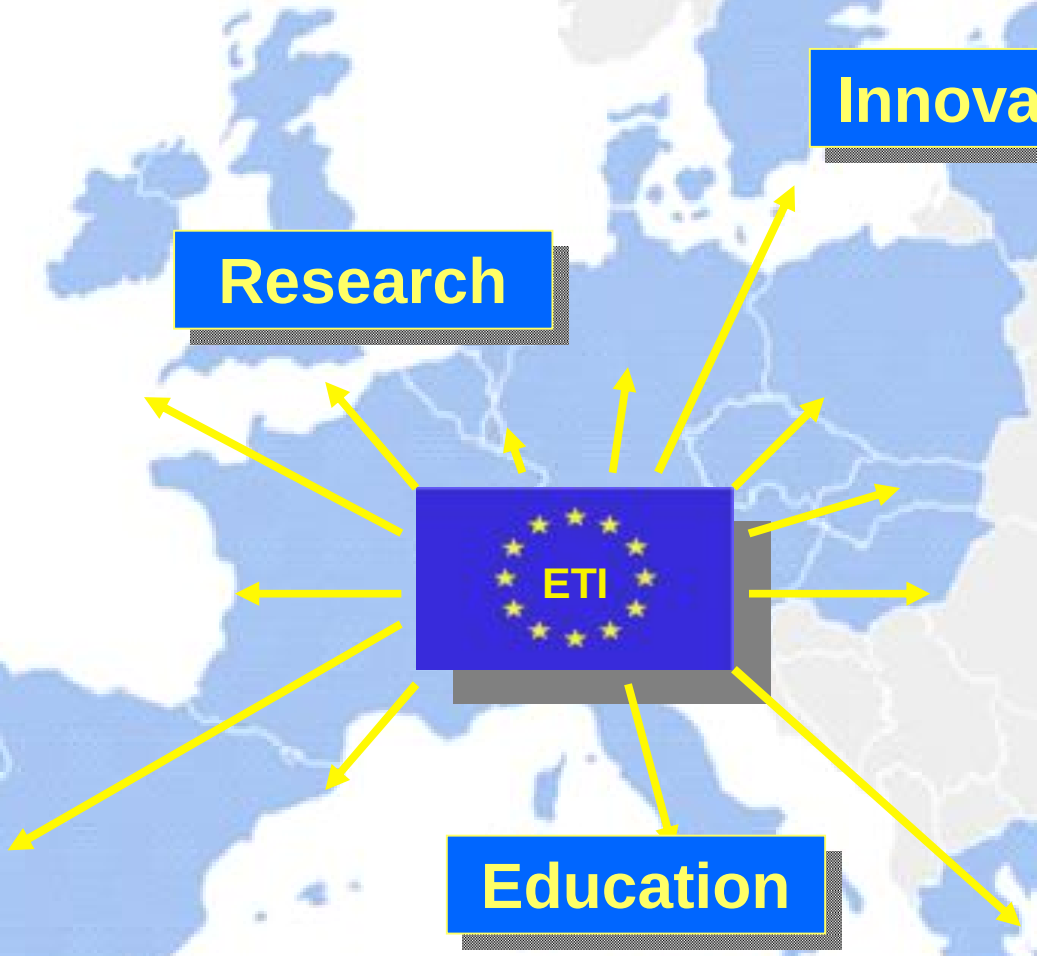
The Modernization agenda

- **Reward excellence**
  - **Increased competition**
  - **Attract and reward the best academics and researchers**
  - **Provide better career prospects to researchers**
  - **Support mobility**

- **Achieve critical mass and create synergies between the excellence we already have.**
- **Strongly integrate the three aspects of the knowledge triangle.**
- **Have a European reference model able to inspire change in existing organizations.**
- **Have a flagship and a symbol of a knowledge based European identity.**

Main Goals of EIT

EIT mission and objectives



perform postgraduate education and research and convert them into commercial opportunity

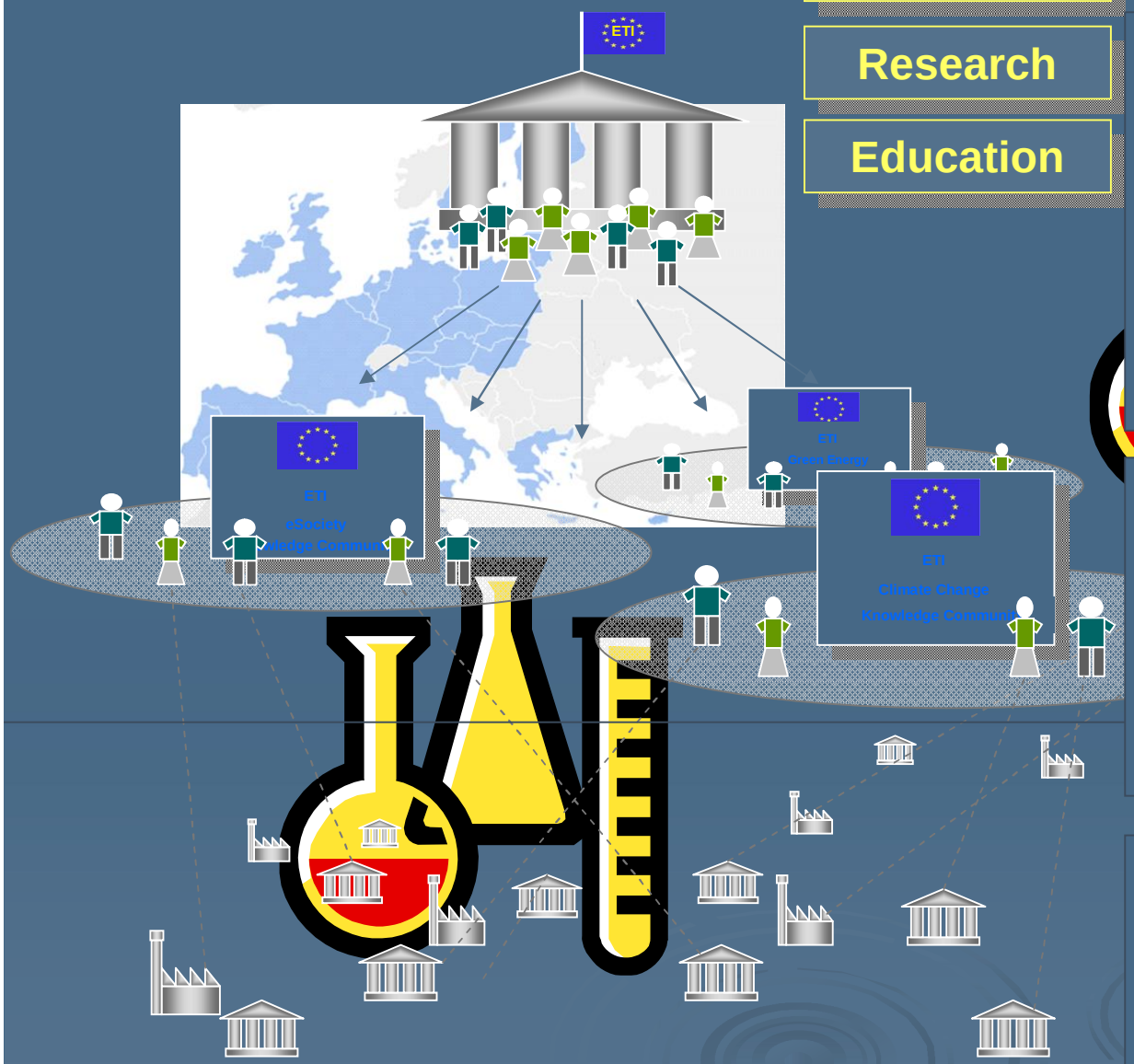
- *To develop research and innovation management skills*
- *To attract researchers and students world wide*
- *To show that new organizational and governance models can work*

The European Technology Institute

Innovation

Research

Education



- Light weight governance structure dealing with stratgy, budget, selection and evaluation of KCs.
- Composed of individuals from the science and business worlds
- A KC will federate teams from universities, research centers, companies from all over Europe to perform research, education, innovation in a strategic thematic area
- These resources are seconded by partner organizations and become, as well as KCs, legally part of the ETI

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First KICs

- **Climate change mitigation and adaptation: Climate-KIC**
- **Sustainable energy: KIC InnoEnergy**
- **Future information and communication society: EIT ICT Labs**

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Conclusions

Universities: key players in Europe's future and transition to a knowledge-based economy

- **Need of an in-depth restructuring and modernization of the sector to face global competition in education, research and innovation.**

Catalytic role of the European Commission:

- **Providing political impetus and targeted funding in support of reform and modernization.**

Commission: Funding with a significant impact on the quality and performance of universities.

- **New programs for 2007-2013**
  - **7th EU Framework Program for R&D**
  - **Lifelong Learning Program**
  - **Competitiveness and Innovation Program**
- **New Structural Funds and EIB Loans**