

# ICT & S&T Cooperation on Capacity Building

2010 Euro-Africa Cooperation Forum on ICT Research

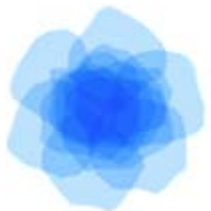
Addis Ababa, 4 Feb 2010

Luis Magalhães

President of **Knowledge Society Agency**

Ministry of Science, Technology and Higher Education, Portugal

“Economic growth is not a bonus, or a by-product of a general policy of fine-tuning financial and macroeconomic balances. In the long-term, economic growth is above all defined by technological progress and the accumulation of human capital”  
*(Third European Report on Science & Technology Indicators)*



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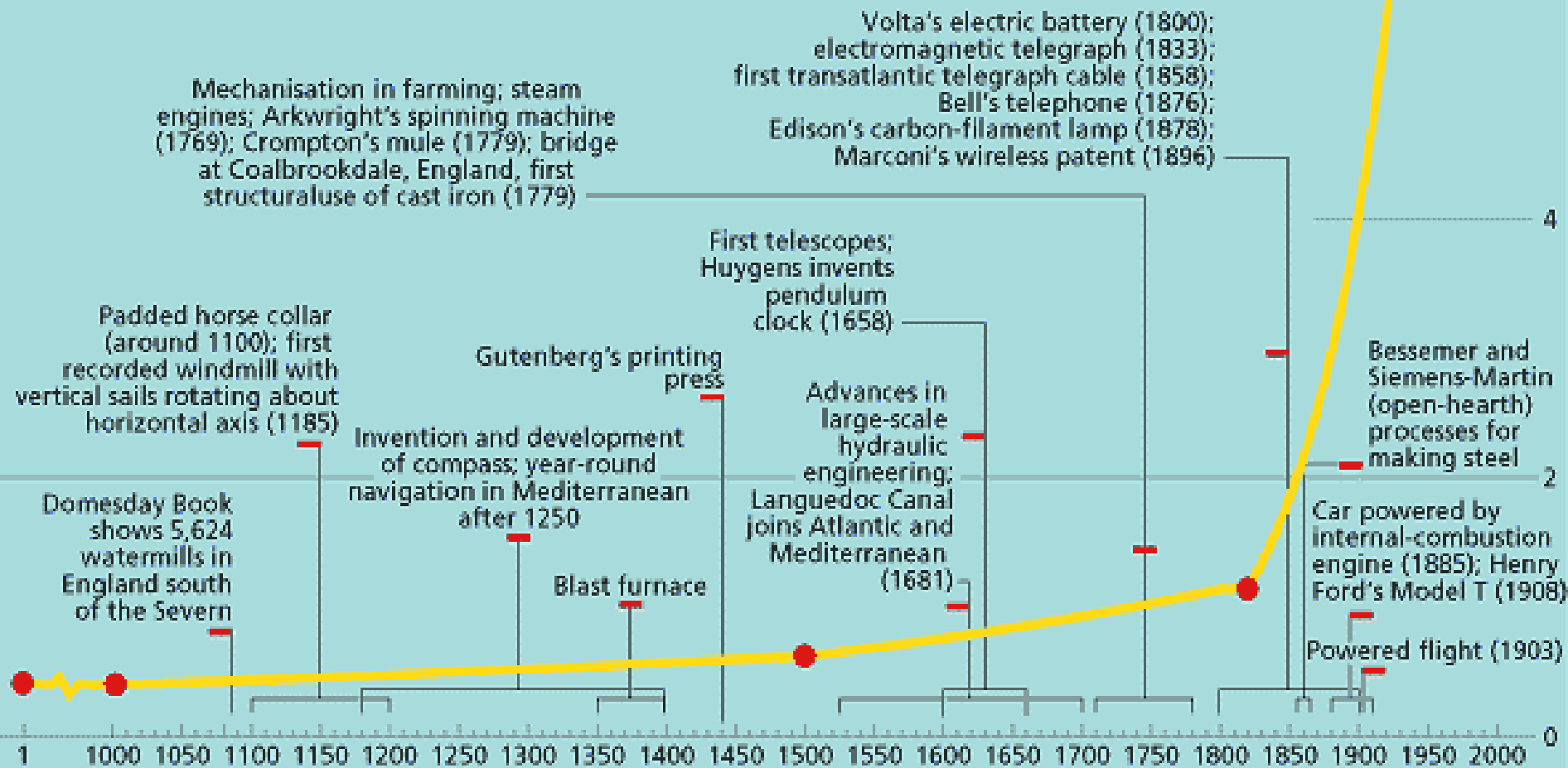
# Accelerated increase of GDP *per capita* only after 1820

*Reason: Organized S&T based innovation*

## Take-off

GDP per person in Western Europe, \$'000, 1990 prices

*The Economist, 31.12.1999*



Source: Angus Maddison

# Foreword

- Some of the points in ICT & S&T capacity building are illustrated by developments in Portugal, as Portuguese capacity building in these areas is rather recent, and may **illuminate possible avenues for development and cooperation EU-Africa**.
- S&T is essentially built on **human talent and deep and intensive collaboration** between different persons. **It is mainly about human beings and not technology or clever programs.** It is essential to support cooperative research projects that emphasize capacity building of human resources and interaction between scientists of different countries and regions.
- **Knowledge is a very peculiar economic resource.** Contrary to material resources, when you give knowledge to others, you do not lose a little bit of it. Besides, in the process of transferring knowledge you end up adding an extra amount to your pre-existing knowledge. **It is a true miracle of multiplication.** This is why scientific cooperation is so promising and *win-win for all*.
- **High speed broadband is essential to overcome the new divides** that happen when powerful new communication technologies are deployed. **It goes in pair with policies to facilitate and intensify the use of ICT.** Both should be the focus of cooperation for development in ICT.



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invest in

People, Knowledge and Ideas

strengthen

International Knowledge Partnerships

assure adequate

e-Science Tools



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# Increase Public and Private Investment in R&D



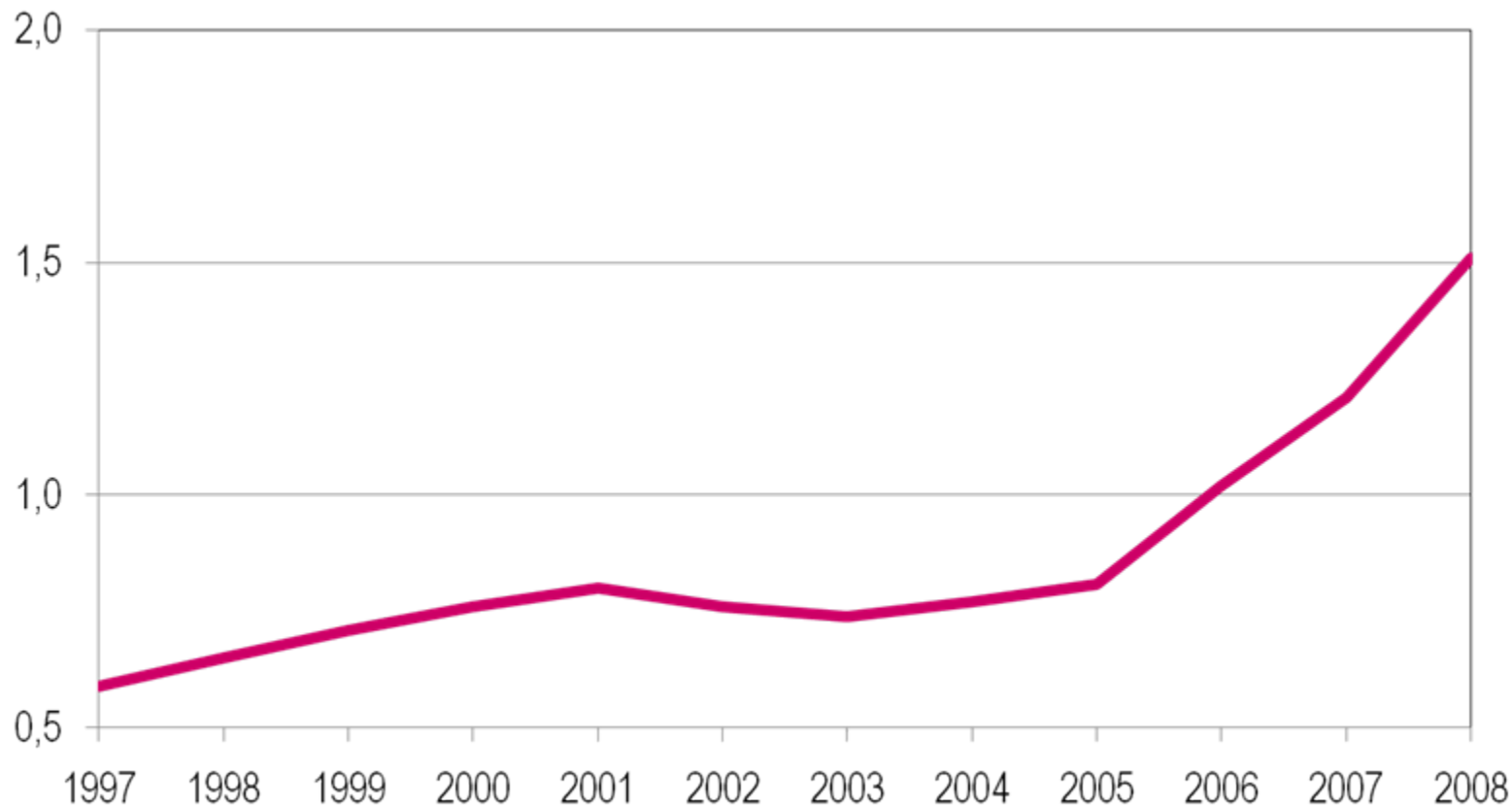
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# R&D Expense Relative to GNP (%), in Portugal



Source: EUROSTAT



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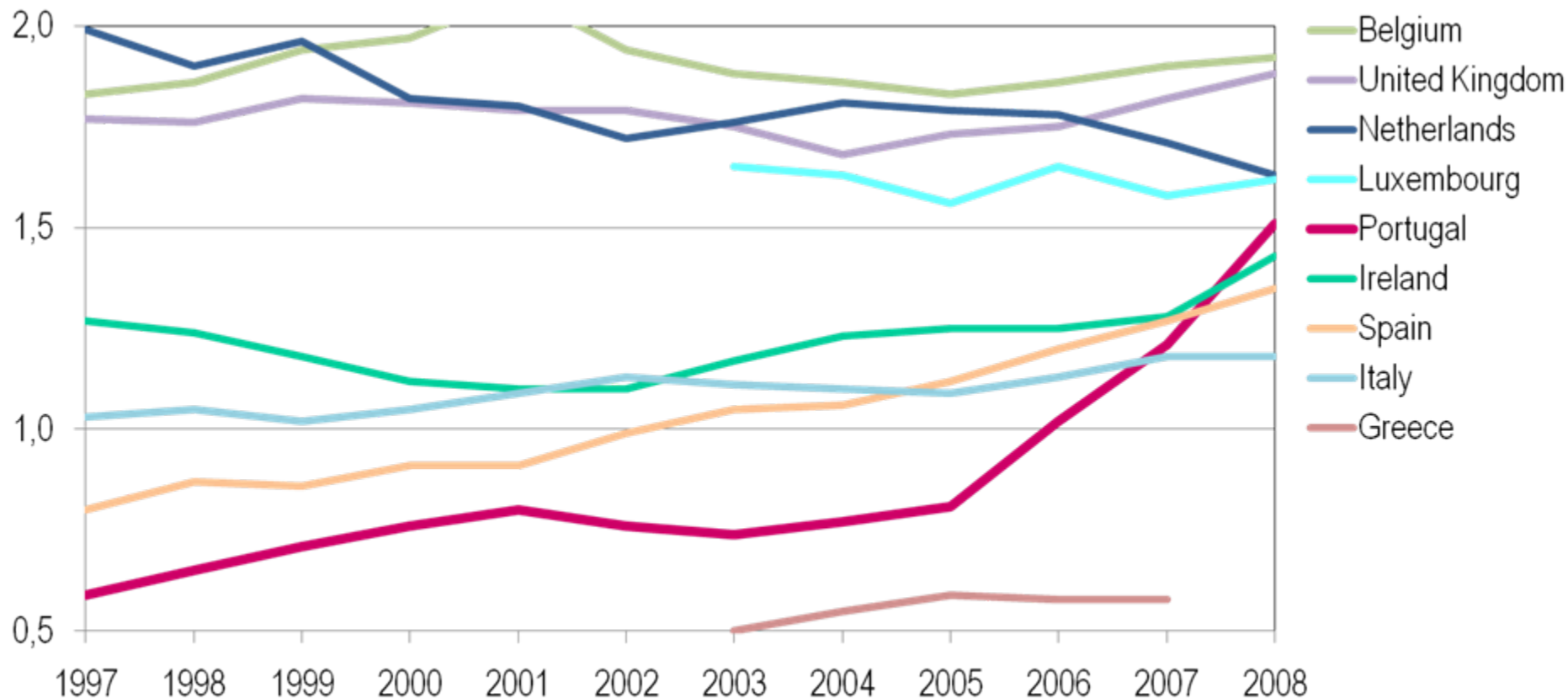


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# R&D Expense Relative to GNP (%), in Portugal

Highest average annual increase (23%) in EU27 (total=1.4%) in 2005-2008



Source: EUROSTAT



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# Invest in People

especially in cooperation with other regions and countries



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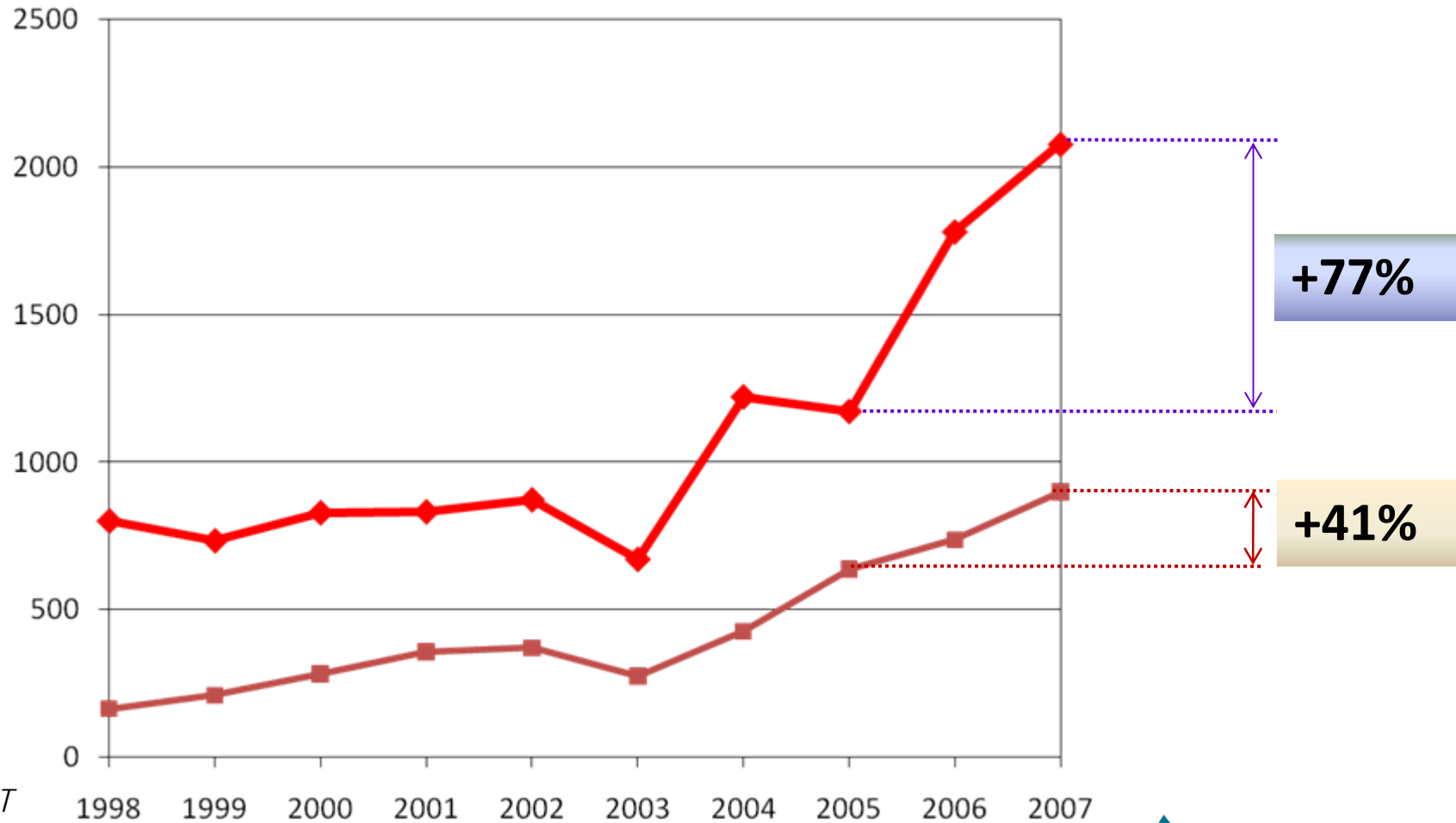
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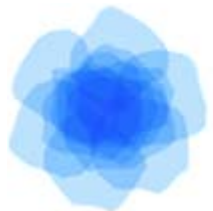


# New PhD and Post-Doc Fellowships each Year

in Portugal (for nationals and foreigners (app. 10%)) and abroad for Portuguese (app. 20%)



Source: FCT



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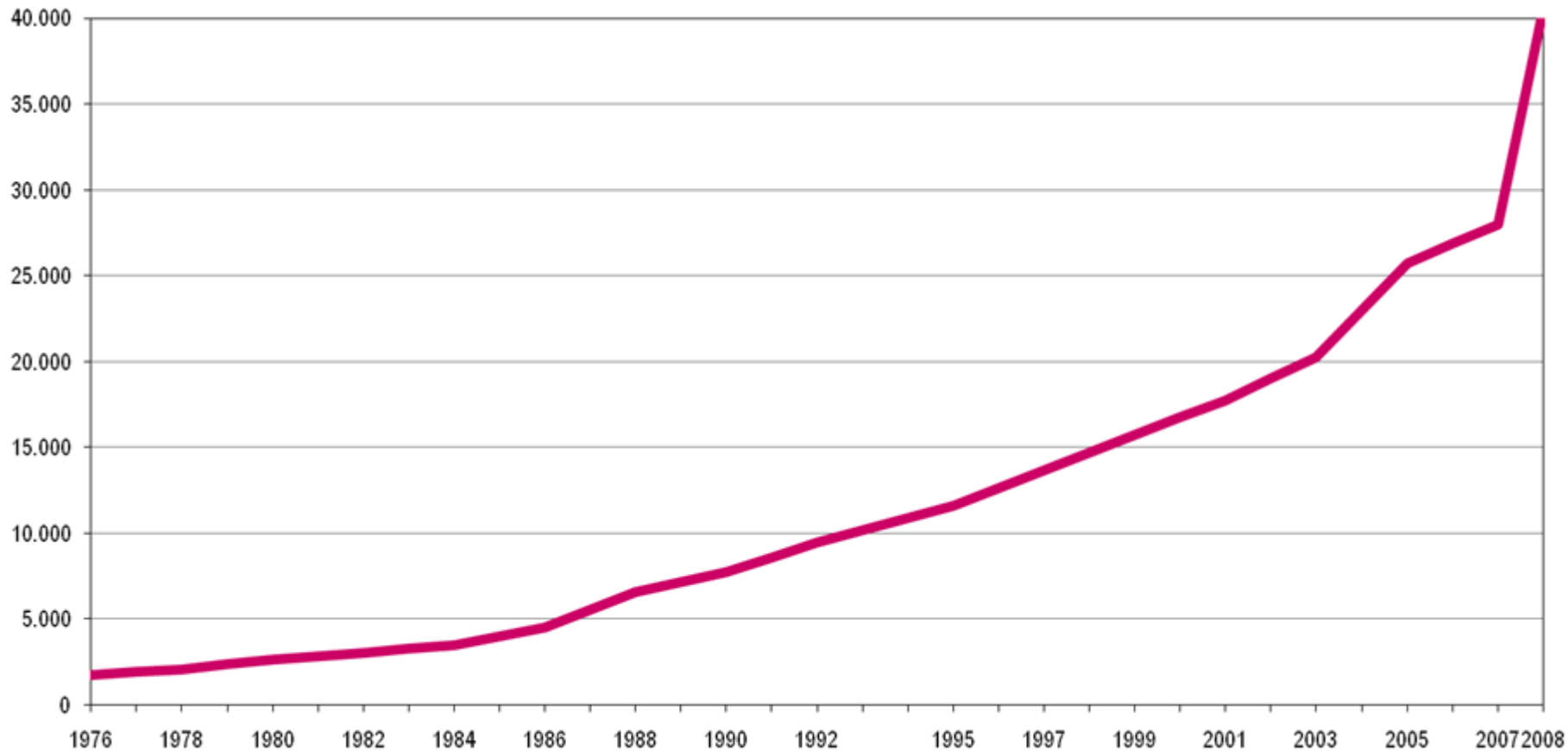


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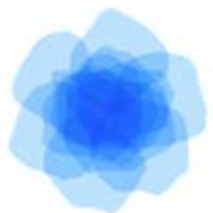
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# Increased Number of Researchers (FTE)

in 1,200 contracts in special program for hiring new researchers 2007-2009, 40% from abroad



Source: EUROSTAT



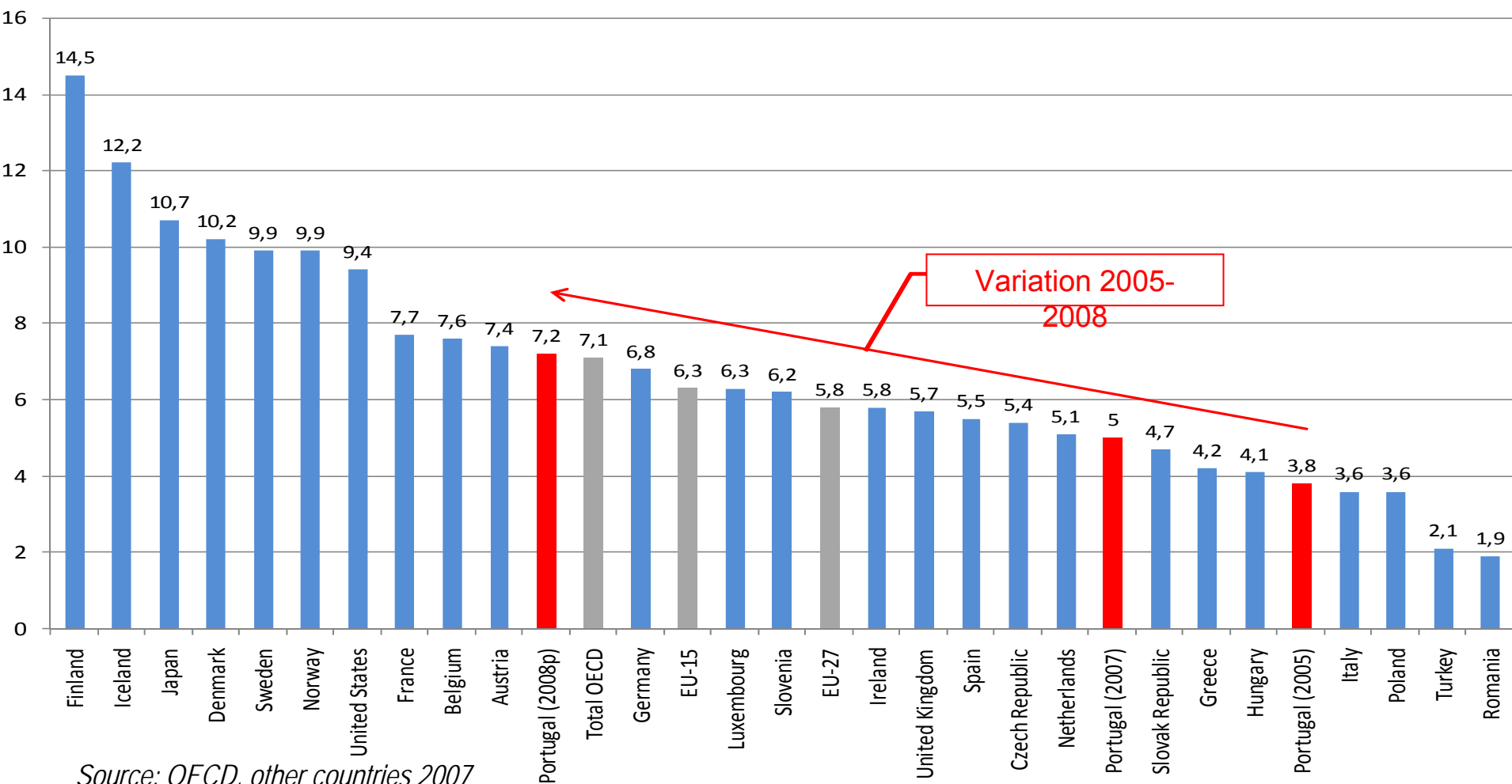
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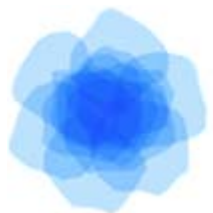
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# Increased Number of Researchers (% in labor force)



Source: OECD, other countries 2007



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# Strengthen International Knowledge Partnerships



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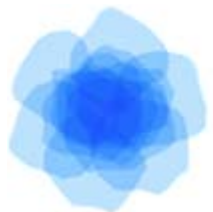


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# Take Globalisation as an Opportunity

- Develop an internationalized knowledgeable, creative and skilled workforce for the knowledge-based society and economy
- Build ambitious International Knowledge Networks involving research institutions, universities and industry
- Create innovative internationalized university post-graduate programs
- Tap on the potential high value of collaborations with cultural and regional diversity
- Enable Networks of Competence to reach global markets
- Attract foreign high-tech industry and R&D investment



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# Partnerships for the Future in Portugal

## Building Ambitious International Knowledge Networks

### → **Distributed Centre for Advanced Training of Scientists from Portuguese-speaking Countries in Areas of Basic Science, as a Category II Centre under the Auspices of UNESCO:**

**5-8 Jul 2009**, at UNESCO World Conference on Higher Education, Portugal announced intention of proposing the Centre to the Research and Higher Education Ministerial Meeting of the Community of Portuguese Speaking Countries (CPLP) and, later, to UNESCO.

**29 Aug 2009**, at Research and Higher Education Ministerial Meeting of CPLP, Portugal submitted the proposal and it was unanimously approved.

**18 Sep 2009**, Portugal formally submitted proposal to UNESCO and offered to support creation of the responsible legal entity and Secretariat, and to contribute to the costs of up to 20 Fellows (Doctoral or Post-doctoral students).

### → **Global Science Program:**

**In October 2009**, as a 1<sup>st</sup> practical step anticipating the creation of the UNESCO Centre, the Portuguese Science and Technology Foundation (FCT) launched the Global Science Programme, opening a **call for proposals for Doctoral and Post-doctoral fellowships** to researchers of *Angola, Cabo-Verde, Guiné-Bissau, Moçambique, S. Tomé e Príncipe, and Timor-Leste*.

# Partnerships for the Future in Portugal

## Building Ambitious International Knowledge Networks

- **Future Internet Technologies:** Next Generation Networks and trusted high-quality services • Critical infrastructures security and trust • Cyber-physical systems for ambient intelligence • Human-centric computing • Language technology • Software engineering for large-scale dependable systems.  
**Public Policy & Entrepreneurship Dynamics in New ICT • Applied Mathematics.**  
Involves 11 universities, 4 major Research Labs, about 20 enterprises.
- **Engineering Systems:** Sustainable energy and transportation systems • Advanced engineering design and manufacturing in electric car and mobile medical applications.  
Involves 6 universities, 6 major Research Labs, 1 National Lab, about 15 enterprises.
- **Advanced Digital Media • University Technology Enterprise Network • Applied Mathematics.**  
Involves 15 universities, 3 major Research Labs, about 10 enterprises.
- **Ambient Assisted Living.** Creation in Portugal, at U. of Porto, of the 1<sup>st</sup> Fraunhofer Institute outside Germany.
- **Medical and Biomedical Research Web Content** for citizens, students and practitioners.

# Partnerships for the Future in Portugal

## Building Ambitious International Knowledge Networks

### **INL – International Iberian Nanotechnology Laboratory**

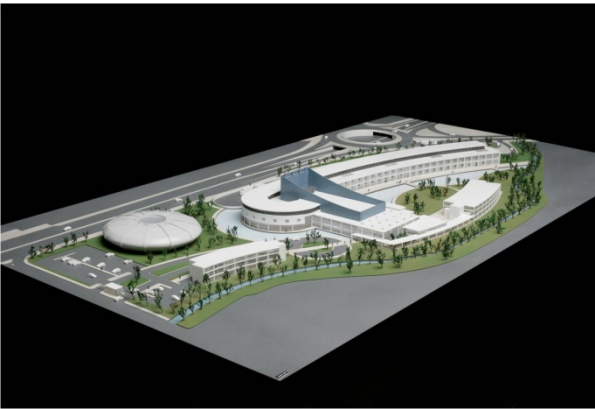
Nanomedicine (drug delivery, nanotechnology for diagnostics) • Environmental Applications, Food and Water Quality Control Applications • Electronic Nanosystems • Nanomachines and Nanomanipulation • Nanotechnology Safety and Impact in Society. **200 researchers, 400 people.**

**International research organization** (1<sup>st</sup> in Iberian Peninsula in any area, 1<sup>st</sup> in World dedicated to nanotechnology). **Created jointly by Portugal and Spain in Nov 2005.**

**Open to membership of other countries.**

Conceptualized in 2006 • Convention w/ Statutes **signed in Summit of Nov 2006** • Treaty **ratified by the parliaments in 2007** • Basis of Design and preliminary construction project in 2007-08 • Council, Director-General and Deputy Director-Geral **appointed in May 2008** •

Construction started in Jul 2008 • Inauguration of building in 17 Jul 2009 • International recruitment of researchers initiated in Apr 2009 • Beginning of research activities **planned for**





# Assure Adequate e-Science Tools

facilitating deployment of needed resources for S&T  
where they are not available  
and

providing tools for long-distance and collaborative cooperation



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# Portugal e-Science Strategy

- **National Research and Education Network** as a Next Generation Network (presently, fiber to 80% of Higher Education System, at 10 Gbps and scalable), **natural connection with AFRICACONNECT**
- **e-U: Virtual Campus** wireless access integrating all Higher Education *campi*
- **b-on: Knowledge Library Online** (17,000 scientific journals, free access in all Higher Education and Scientific Institutions, "*big deal*" at national scale, **protocol w/ U. Cabo Verde**)
- **INGRID: National GRID Initiative** (1,800 CPUs, 1 PetaBytes of disc memory, 2 PetaBytes of magnetic tape robot memory), integrated w/ Spanish GRID (IBERGRID)
- **RCAAP: Scientific Open Access Repository of Portugal** (presently with 25 institutions, incl. all 14 public universities, and >38,000 documents, protocol w/ Brazil **possible to extend to CPLP countries of Africa, America and Asia**)
- **ZAPPIENS: Scientific and Educational HD Videos Repository**
- **IBERCIVIS: Voluntary Computing at the service of science jointly w/ Spain**
- **Tools for collaborative work at a distance**  
HD Videoconferencing and immersive rooms • VoIP for all Higher Education and Scientific System, allowing simple collaborative video- and tele- conferencing • **National platform for scientific and educational advanced digital content** (open courseware for university students, content for professionals to keep up-to-date, content for general citizens), in development for **Medicine** and **Future Internet** technologies, but to be further extended.

# 5 General Practical Rules for Success in the Knowledge Society

- Develop human capital
- Foster partnerships and knowledge networks
- Aim at outcomes and measure them
- Leave room for bottom up creativity
- Promote internationalization and cooperate



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