
Crest Summary Report of Peer Learning Activity 2

**World Class Excellence
Lisbon, May 2010**

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**In coordination with:
Denmark (Leading Country)
European Commission**

WARNING :

This PLA report is a draft that hasn't been circulated to the participating countries yet, nor validated by the host country. The final version will be annexed to the final PLA report

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1. Introduction

1.1 Context and challenges

Global shifts

The search for world class research excellence in response to the emergence of global competition and the knowledge economy has become a major driver in science policies, in R&D funding and evaluation mechanisms across the world. A growing number of universities engage in the search for excellence and prestige. Policy shifts are towards the search for and concentration of talent, increased and more diversified funding resources, more appropriate governance models for innovation, flexibility and responsiveness against a backdrop of new state-university relations based on stronger accountability and autonomy and a more evident mix of public and private incentives and support mechanisms.

European context

Research and innovation is at the core of the EU 2020 Strategy. In addition, The Green Paper on the European Research Area states that “some concentration and specialisation is necessary to permit the emergence of both European centres of excellence competitive on the global scale and a rich network of universities and public research organisations across the entire EU which excel in addressing research and training needs at national, regional and sectoral levels” (p.14). A number of European initiatives for excellence have been launched in recent years, such as in Germany, Denmark, Portugal and the United Kingdom while many others are currently developing similar policies with the aim of improving research capacity or becoming globally competitive. While it is not yet possible to assess the outcomes of such initiatives, it is apparent that they are growing in number and importance.

1.2 Focus

The PLA provided detailed insight into current strategic approaches in European countries for world class research excellence and examined the different challenges and opportunities that they present both at national and institutional levels. It sought to understand how world level competitiveness could be achieved in a variety of research environments, beyond the sole idea of a “world class university”. It looked specifically at approaches for identifying and using potential for attaining world class excellence, prioritisation and investment strategies, and building sustainability. It also reviewed the roles of the different actors at European, national and institutional levels in promoting world class research.

2. PLA structure – Working method – participating countries

Structure

The Peer Learning Activity was organised over two days with a networking dinner prior to the event where participants were welcomed by host country representatives and had the opportunity to become acquainted with one another.

The morning session of the first day included a keynote speech on Portugal's choice of policy instruments to strengthen scientific excellence and internationalise the sector followed by a series of presentations providing greater detail on the different instruments and how they are transforming the national research landscape. The afternoon session was dedicated to short presentations from the participating countries that provided examples of how to identify and use potential for world class excellence as well as prioritisation and investment strategies, highlighting best practices as well as critical areas. This enabled a preliminary set of conclusions to emerge.

The second day opened with a final round of presentations with specific examples for attracting researchers, building clusters of excellence, developing new institutions and providing investment capital for innovative projects. The rest of the day was dedicated to an interactive session on the roles of the different actors in attaining world class excellence and a plenary discussion on sustainability and the implications and effects of world class excellence policies leading to a final set of conclusions for the PLA.

Working method

Peer learning is a voluntary process of co-operation whereby participants can learn from one another through direct contact and the sharing of experiences, interests and concerns. It was the chosen working method for all five CREST PLA events examining different ways in which university reform can improve research capacity. The Lisbon PLA was the second event.

Building on the experience of the first PLA in Copenhagen, a series of tools in addition to the country presentations were used to ensure information exchange and mutual learning. The exercises used the Card Collection to gather individual ideas and provide group discussion, the Gallery Walk for brainstorming and collection of ideas in small groups, and plenary discussions for an open, group exchange of ideas, comments and questions. All exercises were carefully managed by the moderator to ensure a successful outcome both for the individual learners and for purposes of reporting.

Participating countries

There were ten peer learner countries present at the meeting: Belgium, Denmark (leading country), France, Germany, Italy, Netherlands, Poland, Portugal (host country) Spain, Turkey. There was representation from the European Commission and the three external consultants had moderator and rapporteur roles.

3. World Class Excellence

3.1 Defining World Class Excellence

There does not appear to be a common definition for world class excellence that fits all countries but it is possible to identify basic common features. These include high quality of publications and

research output, performance awareness, strong collaboration patterns at national, European and international level with top level institutions, organisations and networks, internal training and recruitment procedures for the selection of highly qualified scientists, international attractiveness in terms of funding as well as human resources, leading positions in some research fields or sub fields and the capability to sustain the excellence effort over time. But even with these common features there is no clear concept to draw the line between outstanding, high quality and world class excellence in research. The participants did not perceive this as a major issue.

What did become apparent was that world class excellence works as an aspiration that engenders a process in which countries aim towards better quality. Each will choose a process and set of specifications and instruments that fit best with local conditions and ambitions but will need to develop a road map that guarantees the realisation of pre-conditions for excellence. This entails identifying potential and selection processes, choosing priorities and providing investment funding, attracting world class researchers, forming regional, national and international networks to promote world class excellence and realising potential at the institutional level. Each stage in the process requires appropriate monitoring (including dialogue and feedback with stakeholders as well as reporting) and transparent evaluation (ex-ante and ex-post). Although there may not be an exact concept of world class excellence, the aspiration of world class excellence can be a powerful driver in developing an international position in research, as long as this notion of world class excellence as a process does not lead to frustration when an institution or country realizes that the attainment of world class excellence is unrealistic.

3.2 Approaches for identifying and using potential for world class excellence

Developing approaches that can identify and use potential for world class excellence is the first step on the road to excellence. In order to assess potential there must be a clear and honest assessment exercise and international contributions can play a key role in providing critical analysis and opening up the system.

Strategic investment choices have to be made on the levels of world class excellence units (and the units could be different: researchers, research teams, universities, clusters, etc.) and processes have to be defined to make the selection. A “nucleus” for world class has to be found on the basis of the concentration of talent but access to leading international networks is also essential in order to become globally competitive. Further strategic decisions have to be made at the institutional level in terms of internal measures and governance arrangements to foster excellence, and feedback systems must also be put in place to measure achievements and set new objectives.

Portugal provided a clear example of its chosen roadmap with four steps. It started with a national research assessment exercise using international expertise before embarking on a strategy of building up associated labs for critical mass, developing international strategic partnerships to catalyze international networks and create industrial collaborations, and finally enhancing institutional autonomy by encouraging governance reform leading to the development of university foundations. The process has significantly changed the country’s research landscape and there are visible signs of increasing maturity of the system and enhanced international

attractiveness as a research destination. This is not the only possible process structure but it provides a good example for a sequence of coherent steps.

3.3 Prioritisation and Investment Strategies

The second step on the road to excellence is prioritisation and focused investment. The country cases highlighted a broad diversity of approaches indicating that the chosen pathway should be closely linked to the specific country context.

A first approach is to make major investments in a small number of selective areas.

Germany launched the Excellence Initiative to strengthen universities, increase international visibility and enhance competition. It seeks to foster plurality of excellence rather than defining what the model of excellence should be. The competitive funding provides support for graduate schools to promote young scientists and researchers, clusters of excellence to promote cutting-edge research and institutional strategies to promote top research. The programme has had clear impact in Germany. It has stimulated strategic thinking with universities developing a clearer research profile and increasing co-operation across disciplines, between universities, and with other research institutions. At the same time there has been increased competition to the benefit of the whole system and international visibility has improved. Private funding has also increased.

France seeks to foster excellence of the whole range of institutions, stimulating relevant partnerships between them, encouraging them to develop appropriate strategies according to their institutional profiles. It does this by creating poles of competitiveness outside Paris between universities and industry, developing Thematic Networks for Advanced research (RTRA) and setting up Poles of Higher Education and Research (PRES), regrouping universities and allowing them to develop a la carte integrated strategies, such as doctoral schools.

Spain sees itself as a country that is still “catching up” in the global production and use of knowledge. It has opted for a model of international campuses of excellence built on three concepts: aggregation (realisation of university mission in and with the local environment and region), excellence indicators (for the development of teaching, R&D and innovation) and international reference (for visibility and mobility). The campuses have been selected following an evaluation by an international commission that included a range of professional competences and are now in the early stages of development.

Poland has introduced competitive funding for a selected number of leading domestic research centres located in universities or in clusters with other research institutions (KNOWs). The selection is performed by a commission including international experts and the funding provided tops up academic remuneration and scholarships as well as brings in fresh talent from abroad. The funding is part of a broader reform to promote greater autonomy and stronger links with industry with the aim of improving research quality.

Belgium presented a Flemish initiative to build excellence via internal funds for capacity building (structural funding provided by the Hercules fund), competitive research (special fund for leading researchers provided by Methusalem and Odysseus funds) and prioritisation (limited number of large grants that are part of the Methusalem fund). The government conditions and quality standards for these funds are: excellence, objective selection, quality focus, consultation by a range of experts (scientific, external, international), as well as other data sources to inform the process. Funds are distributed by performance based quantitative keys with different parameters

for different projects. An attempt is made to balance a top-down and bottom-up approach involving both government and universities in the decisions on the development of excellence.

These country examples point again to the fact that there is no exact common definition of world class excellence. Depending on a country's situation the objectives behind world class excellence vary, and in some cases integrate other objectives such as regional or industry-related aspects.

A second approach is to develop partnerships with world class institutions at national or international level.

Portugal provided the examples of the University of Porto and the Technical University Lisbon that have increased industrial involvement by setting up partnerships with companies, leading to the development of an eco-system of network of companies working on research programmes. The Universities have also entered partnerships for research training and collaboration with Carnegie Mellon and MIT in the United States, creating a strong brand association for both institutions. The objectives of these partnerships are to transform scientific and engineering training in Portugal through a new research and knowledge network that can advance knowledge and transfer technology to Portuguese firms, enabling them to become leaders in the selected areas.

Denmark's UNIK initiative provides investment capital over a five-year period for excellent university research in highly innovative areas. It aims to promote world class research and innovation through the development of research groups at universities that attract top researchers from industry and universities in Denmark and abroad. It gives significant freedom in use of funds and keeps bureaucracy to a minimum in the belief that world class develops bottom-up. The high levels of funding for innovative projects have enabled the universities to build large international research teams and strengthen their research networks. Since it is clear that the funding will not continue after five years, the ministry is discussing "business plans" with the universities to identify opportunities for embedding the research groups in the university funding and attract new funding from other sources to secure future sustainability.

A third approach is to focus at the level of the individual and create programmes to attract the best researchers, both national and international.

The Netherlands see investments in top talents as a key approach to stimulate innovation and ensure a top world position for the country. It established career grants for excellent researchers at different career stages (under the headline "*veni, vidi, vici*") 10 years ago and these are now well embedded in the research system and career policies of the universities, although they have been more successful in retaining and promoting national talent than attracting international talent.

Turkey has a wide range of programmes for human resources in science and technology to address the different needs in each age cohort or career phase. The Tubitak HRST programmes support PhD students in domestic programmes to perform research abroad, provide grants for highly qualified students seeking to complete their PhD studies in Turkey, offer postdoctoral research opportunities for incoming and outgoing researchers, fund scientists for short-term mobility, support young PhD holders in the early stages of their career, provide opportunities for national researchers to include international experts and promote the return of Turkish PhD holders from abroad.

A fourth approach is to develop institutional structures and reform governance arrangements.

Excellence can be developed at institutional level by means of governance instruments for institutional autonomy and accountability, transparent recruitment procedures based on open competition at national and international level, career paths linked to performance assessment, provision of facilities and research infrastructures for high level researchers, management of large scale facilities and research infrastructures of international relevance, attraction of international funding, development of an appropriate combination of internal priority setting and evaluation.

Portugal presented the strategic choice of transforming universities into autonomous foundations as a key component in the drive towards excellence. Becoming a foundation grants independent legal status while funding is still provided at the central level. The objectives are to strengthen university autonomy and the capacity to manage people and finance independently of the Ministry but also to make the universities more attractive to the Portuguese diaspora, to external stakeholders and to the international community. The new arrangements aim at overcoming what has thwarted the system until now: poor investment in research and doctoral training, poor governance, lack of internationalisation and external engagement which has meant only limited contribution to the national economic needs.

The creation of the Karlsruhe Institute of Technology in *Germany* from a merger between a state-funded university and a scientific Helmholtz research centre almost entirely funded at the federal level has led to a new governance structure which has not been without its legal challenges. The regrouping of research units was realised through a combination of top-down and bottom-up initiatives. This is seen as a major success factor. On the one hand, the researchers could organize themselves according to their research interests, while on the other hand the university sets top-down priorities in certain fields and topics in line with the strategic goals.

The new process for excellence in *France* is changing the way higher education and research are organised and distributed across the country and this is leading individual institutions to reform their governance structures in order to adapt and respond to the new arrangements.

Several observations can be made regarding initiatives to promote excellence:

1. Initiatives for excellence most often involve one of two forms of integration or a combination of both: Topical Integration (integration of excellent researchers to form units addressing a topical issue) and Competence Integration (integration of top researchers (nationally or internationally) in a field into one project or unit).
2. Often research networks in excellent units are international while business/outreach networks are national/regional.
3. An important feature of processes for excellence, international peer review is most often connected to prioritization for excellence both nationally and at the institutional level. This inserts an element of internationalization in all excellence initiatives.

The role of "competition for talent" in relation to excellence varies from country to country: In some countries excellence is connected to the allocation of money, which creates strong units that may attract international staff, while in other cases, the money is used to attract international or diaspora staff, which in turn can form the core of an excellent unit.

3.4 Roles of the different actors in developing world class excellence

There are many different interpretations and combinations of the different approaches as highlighted in the country examples. However, whatever direction is chosen, its success will depend on the involvement of the different actors and their ability and willingness to make an active contribution. The table below summarises the roles the different actors can play in achieving world class excellence as they were identified in the peer learning activity of “Gallery Walk”.

Actors	Role
<p>Individual researchers/research groups</p>	<p>Career: Make an active decision for a research career, ensure lifelong training, find time to <i>do</i> research</p> <p>Internationalisation: Be mobile, teach (internationally), build international partnerships and disseminate research results (internationally)</p> <p>Co-operation: Have an open attitude and connect to other researchers, attract the best, co-operate with complementary researchers</p> <p>Competition: Compete for resources, aim to be the best</p> <p>Attitude: Be flexible /sensitive towards institutional priorities, maintain social responsibility towards stakeholders (goals of institution, industry, government), raise awareness /communicate about the need for research (funds)</p>
<p>Institutions/Leaders</p>	<p>Strategy: Create an international profile Have a clear vision on future positioning Understand potential and identify priorities (i.e. evaluate and act) Build /ensure institutional, long-term commitment Have a clear, strategic, long-term institutional governance (visional leadership) Make the institution more than the sum of its parts</p> <p>Funding and Facilities: Create the internal environment (funding, facilities, etc.) Create opportunities (e.g., several funding sources) Enable access to large infrastructures (also through cooperation and funds) Supply specialized administrative support to world class excellence unit</p> <p>Human Resources Policies: Organise the attraction of excellent researchers Make peer review mandatory (external experts) Eliminate poor performance Lobby and support funding initiatives Force staff abroad (sabbaticals) Support technicians’ careers (incl. PhD)</p>

	<p>Strategy: Set the national goals towards “excellence” Reform governance for autonomy and accountability Provide framework strategy Balance academic interests with economic/industrial needs</p> <p>Funding and facilities: Opt for selective financing</p>
National governments	<p>Allocate funds through competitive evaluation processes Increase share of core funding based on performance Support recruitment of top academics with international profile Set up incentives for foreigners/diaspora to settle Avoid fashion-funding Provide large infrastructures Co-operation Work towards bilateral/multilateral agreements Enable active international relationships Enable international implants of foreign universities (being careful of dangers of non-sustainability and franchising)</p> <p>Accountability: Ensure proper regulation Set up control mechanisms (transparency, accountability, evaluation, simplicity in reporting, etc.) but not by the government directly</p>
European Union	<p>Strategy: Promote common understanding so states can drive their own policies. Foster mutual learning Lower barriers for institutions, including funding Organize competition at the European scale Promote greater consistency in terminologies (what is world class excellence, peer review, performance indicators, accountability)</p> <p>Funding: Provide seed money Employ very specific funding instruments (ERC, etc.) mixed with broad instruments Move money from agriculture to research</p> <p>Co-operation: Stimulate international cooperation (in research, research policies / e.g. PLA, in research education – PhD) Provide advocacy to MS for research on societal issues that cross country borders</p> <p>Accountability: Support, assess, interact, reflect Reduce administrative requirements for FP programmes (copy NSF standards - a post evaluation).</p>
	<p>(Private) foundations, charities, non-profit organizations: Provide awards, promote mobility, provide infrastructure, bring about new strategic initiatives.</p>

<p>Other actors</p>	<p>Funding agencies: Provide policy role through funding instruments, science assessment, control against academic inbreeding</p> <p>Private companies: Provide infrastructures, bring about new strategic initiatives, provide experiences for professors, support PhDs, offer graduate teaching, provide inter-sectoral mobility (university – company), contract research, identify new challenges in specific fields (where in line with their interests)</p>
	<p>Research funding councils: Provide and support transparent mechanisms for competition; members need to become international but there are language issues.</p>

3.5. Sustainability of efforts towards research excellence

An important aspect in choosing the different pathways is the cost involved in reaching world class excellence and a final step is the issue of guaranteeing sustainability of the various endeavours. Once critical mass has been identified it must be sustained over time. Expensive infrastructure for world class excellence research must be funded and maintained. The level and nature of public policies towards research and academic excellence and their interaction with private funding schemes need to be determined in order to guarantee the required long term sustainability of the research enterprise.

Choices for short-term funding run the risk that the research may not survive, or will go elsewhere, if no alternative sources of financial support are found or the research unit fails to embed it in its own funding structure. On the other hand, long-term funding might lead to reduced dynamics and return to more traditional ways of operating. The Danish project provides venture capital for a limited time period only and risk is part of the dynamic – the universities are expected to imbed the new units of excellence into their budgets, if the units are successful. Some German universities, for instance the RWTH Aachen, have also introduced a model of small funds for many innovative projects but each selection reduces the number of projects until only a few are left with significant funding levels.

Sustainability is not only a financial issue. Reaching excellence can be successful or not for other reasons than the levels of funding. The overall political environment and degree of support it provides is important. The effect of excellence on system sustainability is dependent on its integration with business, teaching or outreach activities. Industrial partnerships are fundamental but decisions have to be taken on whether to let them develop spontaneously or create structures for technology transfer.

Robust evaluation procedures are also key to ensuring critical data on results is available for the purpose of fostering improvement and informing strategic choices. Evaluation procedures will change over time becoming increasingly stringent as the level of research improves but this is part of the process of the road to excellence.

There are also broader issues of goal conflicts with other political objectives, especially with increases in student population or other educational issues. The question arises of how world class research units are integrated into higher education systems and what the implications are for differentiation, segmentation and stratification of the higher education sector at large. It is

unclear how the search for excellence impacts the diversity of institutional profiles. There can be unintended side effects of the world class orientation that require appropriate attention.

Such broad debates were beyond the scope of the PLA where the focus was placed more on identifying the role of the different actors in guaranteeing sustainability in the search for excellence. The outcomes summarised in the following table emerged in the peer learning activity of "Card Collection."

Important Measures for Sustainability	
<i>Financial stability</i>	Sustainability of research institutes, universities Long-term personnel and maintenance of structures
<i>System stability</i>	Secure links between excellence and the system at large Inclusion of benefits to society in definition of excellence Combination of university initiatives and government priorities Research opportunities for good research units (not only excellent units) Segmentation and positive discrimination Research policies for all disciplines Label of excellence for maximum 15% of institutions
<i>Timeline</i>	Clear timelines Long-term thinking
<i>External engagement</i>	Co-funding from external sources Involvement of companies Concentration of start-ups and spin-offs from the university
<i>Framework Incentives</i>	Transparent peer-review system with financial consequences Criteria of excellence in university funding schemes Target agreements on business plans
<i>Research staff</i>	Policies for retention Attractiveness for talented students and researchers, both home and abroad Increased internal internationalization of universities Promotion of research careers
<i>Management</i>	Appropriate governance and strategic management Internal mechanisms to deal with risk Autonomy of researchers Merit-based recruitment policies

Critical factors

A number of challenges associated with sustainability in developing and maintaining levels of world class excellence emerged during the various plenary discussions.

Funding and facilities: There may insufficient funds or infrastructure to carry out the research or provide a stable future for excellent researchers or research groups.

Decreasing dynamics: Competitive funding for excellence runs the risk of becoming institutional funding leading to inbreeding and lack of brain circulation.

Willingness and ability to change: There may be resistance to change or inability to select priorities or develop networks and partnerships.

Keeping balance: There is always tension in the balance between bottom-up and top-down approaches or between competition and co-operation.

Goal conflicts: Teaching loads may prevent development of academic careers and non-teaching researchers may create isolated units within the university. Focus on research excellence may lead to neglect of other university functions.

Unintended effects: As so many countries strive for world class excellence, competition for the best researchers may overheat. The notion of excellence may become inflated and lead to a monoculture of only one first best profile. Over-reliance on performance indicators might develop and size may be regarded as a goal in itself. Internationalization may become a goal at any cost.

3.6. Suggested key conditions for success

A number of key conditions for success emerged during the PLA.

1. A certain “road to excellence” is apparent across the different countries but the choice of specifications and instruments are locally determined according to needs, capacities and ambitions. Portugal presented a clear road map for its own objectives for excellence.
2. There are a number of pre-conditions that a country needs to fulfill if it seeks to become a global player: carrying out a research assessment exercise, shaping the landscape and forming research groups are good starting points, but there must also be relevance of strategic focus of research units and career promotion instruments for talented researchers. It must be remembered that developing the pre-conditions for world class excellence requires significant time and effort.
3. It is hard to define what world class excellence is but it does have some general features: leading international position, outstanding scientific achievements, high outcome measured in indicators, good assessment in peer review, attractiveness for researchers, solid funding base, excellent infrastructure and good governance. However, regarding these features, it is hard to say where the difference between world class excellence and high quality of internationally-oriented research lies. Therefore, world class excellence is more a political concept than something that can be clearly measured. As long as this aspiration remains plausible and helps to improve quality of research without jeopardising diversity of profiles, it is a beneficial concept.
4. There are three types of interpretation of world class excellence that could be identified in the presentations of national initiatives. The different initiatives place emphasis on one of the concepts but all countries seek to achieve a balance.

- world class excellence implies perfect autonomy and flexibility for the best individuals (e.g. career grants in the Netherlands);
- world class excellence requires adequate structures and institutional strategies (e.g. investment funds in Denmark);
- world class excellence is created through relations to the environment (e.g. campus of excellence in Spain).

5. It is important that each country develops objectives that are in line with the national situation and requirements. The elements of the prioritization process have to be in line with these objectives. In other words, the policy should identify the situation and problems, define objectives that respect plurality of excellence, identify the units of excellence, define a process of selection for priority areas and establish performance indicators.

6. The country examples gave specific ideas about success factors for world class excellence strategies:

- Research assessment: differences in fields such as humanities and arts should be taken into account in the assessment methods but there should not be any exceptions from the general principles of assessment.
- Partnerships with world leaders: a comprehensive approach for education, research and innovation should be adopted if partnering with leading institutions is intended
- Attracting top researchers: if salary levels are not competitive, alternative benefits such as autonomy and strategic responsibility can be offered.

7. All world class excellence policies undertake focused investments, but policies may differ in two ways:

- The degree of focus varies (systems with few large investments or with a multitude of investment pools for different purposes)
- Segmentation through the creation of a small number of world class institutions is more or less explicit.

8. All world class excellence policies are mixtures of inducing co-operation and competition. National co-operation might reduce national competition, especially in small countries, but it also increases international competition by putting the institutions in a position to compete.

9. Funding is key to the development of world class excellence. Formula funding is not able to induce world class excellence in itself, but by creating performance awareness, it acts as a precondition for the path to excellence. Competitive funding has different orientations towards certain fields, research types, career phases, sizes of projects or other targets. It is essential to define the purposes and uses of a grant as this will determine the incentive and the notion of world class excellence. Systems for funding or promoting excellence can look quite similar but effects depend on operationalisation (short or long time horizons, degree of financial freedom, nature of monitoring, link to actors). Difference in details matter because they induce different effects.

10. World class excellence policies are successful if the academics accept the objectives and their acceptance will be enhanced if they are given the opportunity to participate in running and designing the system, as highlighted in the Flemish and Danish examples.

11. World class excellence requires institutions to become more open in human resources policies for attraction, promotion and retention of researchers. Inbreeding was frequently highlighted as a strong impediment to the development of excellence.

12. Although there is a general dissatisfaction with current ranking systems, they are nevertheless taken into account as a measurement of excellence. Therefore, there is a need for a European alternative that takes into account the diversity of profiles and operations and does not focus on a single model of world class excellence.

3.4 Outcomes and lessons learnt

There were a number of general lessons learnt that can serve to inform policies for world class excellence.

1. Excellence is a term that should be used with parsimony as over-use will lead to devaluation of the concept.
2. Excellence has to be a concept that is targeted at a small group of performers.
3. Excellence is a process and a dynamic concept. It is inherently instable.
4. There are a number of orientations and ideas connected to excellence.
5. It is not necessary to measure excellence exactly. There is no need for an EU or national standard saying that if you pass a point, you are now excellent, but the concept and the processes it induces help to improve quality overall.
6. It should only serve as a motivation and not be a source of frustration. Not all universities can reach world class excellence and not all reach it in the same way. The systems have to be open for multiple concepts of excellence.
7. Excellence should not be just related to statistics. It means more than simply moving up in the rankings.
8. World class excellence should not be the goal of all institutions. It is important for system sustainability to have a diverse base and with different missions. If all funding and interests go in one way, it can be a problem for the system. There has to be balance.

4. Evaluation of PLA methods

There were aspects of the PLA that were appreciated and other areas identified for improvement. Peer learning as a method for learning and mutual exchange of information was evaluated positively by the participants. Participants judged the information provided as relevant and transferable to their own professional context and felt they had been given access to information that otherwise would not have been available. They appreciated the networking opportunities of a small group. Overall, they felt that a two-day meeting was an appropriate length, that the event was well organised and the content of high quality.

Compared to the first PLA, participants considered that the composition of the peer group had set some limitations insofar as not all participants interacted in the exercises and discussions. This gave the impression that they were less motivated or less able to contribute. A number of people confirmed their participation at the last minute or were asked to replace cancellations and this may have had an impact on their level of willingness to participate fully in the event. It also created organisational challenges as feedback forms or presentations arrived very late or not at all.

During the event itself, the challenge is always finding enough time for all the country presentations and ensuring there is meaningful discussion with learning effects. After the experience of the first PLA, the moderator introduced a more structured approach for the panel discussions but these were often cut short by speakers overrunning the time allocation. Clearer speaker guidelines could be prepared to ensure this does not happen as many participants noted that there had not been enough time for interaction and discussion in the plenary sessions.

It would appear that participants need to receive clearer information on their role as peer learners ahead of the event since many appear unaware that a different approach is being used, but for this to be effective there needs to be more strategic and timely selection of the participants.

5. Conclusions and perspectives

The second PLA on world class excellence confirmed the trend towards strategies and policies aimed at enhancing research capacity and developing units of excellence within the systems. It showed there was no single definition of what world class might be but that there are certain features associated with the achievement of world class excellence. Any country embarking on such a road must meet the necessary pre-conditions, although the actual roads chosen may be very diverse according to the capacities, needs and ambitions of the local contexts.

Since many of these initiatives are in their early stages, it is not yet possible to assess whether they have in fact reached outcomes of world class excellence. However, it is apparent that they are growing in number and importance. What also became apparent is that world class excellence can be an aspirational concept that is used to develop a road map with a set of goals and instruments that enable countries to improve research quality.

Amongst issues to be further taken up, the PLA underlined the potential tension between the promotion of an elite segment and the need to ensure the quality and the sustainability of the higher education system as a whole. Directly related to this, issues such as diversification of institutional profiles, segmentation of the higher education sector, funding choices are of utmost importance.

ANNEXES

**“PLA on World Class Excellence”
in Lisbon, Portugal
May 2-4, 2010**

Sunday 2 May

19.30 **Welcome buffet and registration at Hotel Villa Galé Opera, Room S. Carlos**
Welcome by Prof. João Sentieiro, President of the Foundation for Science and
Technology.

Hotel Vila Galé Opera, Travessa do Conde da Ponte, 1300 Lisboa, www.vilagale.pt

Monday 3 May

The meeting venue is the Auditorium Centro Cientifico e Cultural de Macau, Rua da Junqueira, 30 -
1300 Lisboa (walking distance from hotel).

Chairs: Pedro Guedes de Oliveira and Frank Ziegele

Rapporteurs: Diane Carr and Fiona Hunter

09.30-1000 **Welcome Address**

Prof. Manuel Heitor, Secretary of State for Science, Technology and Higher
Education

10.00-10.20 **Introduction into PLA by EC and coordinating country**

ERA and the Crest Peer Learning Activities on Universities, Head of Unit Stefaan
Hermans, DG Research, European Commission

Peer Learning – Method and Focus, Jakob Williams Ørberg, Danish Ministry of
Science, Technology and Innovation

10.20-11.20 **Developing Excellence in Portugal (Part 1)**

- *Opening up Universities and Strengthening Scientific Excellence: the Case of
University of Porto Foundation*, Prof. Pedro Guedes de Oliveira, University of
Porto

- *International Evaluation of Research Institutions: Empowering Research for University Excellence*, Prof. Cláudio Sunkel, University of Porto and Director of the Institute for Molecular and Cellular Biology
- Q+A

11.20-11.50 **Coffee break**

11.50-12.50 **Developing Excellence in Portugal (Part 2)**

- *Developing Research and Advanced Training Networks through International Partnerships*, Prof. João Barros, University of Porto and Director of the Partnership CMU|Portugal and Prof. Paulo Ferrão, Technical University Lisbon and Director of the Partnership MIT|Portugal
- *Human Resources for Scientific Excellence: Fostering Brain Circulation and Attracting Talent*, Hugo Horta, PhD, Adjunct of Secretary of State for Science, Technology and Higher Education
- Q+A

12.50-14.00 **Lunch**

Moderator: Frank Ziegele

14.00-15.30 **Country cases (Part 1) - “Identifying and Using Potential for World Class Excellence”**

15.30-16.00 **Coffee break**

16.00-17.30 **Country cases (Part 2) – “Prioritisation and Investment Strategies”**

17.30-18.00 **Sum up and Card Collection**

20.30 Dinner at Clube de Fado at the typical Lisbon District of Alfama

Tuesday 4 May

The meeting venue is the auditorium at Centro Cientifico e Cultural de Macau, Rua da Junqueira, 30 - 1300 Lisboa.

Moderator: Frank Ziegele

Rapporteurs: Diane Carr and Fiona Hunter

09.30-09.45 **Short presentation of the themes / workshops of the day, presentation of card collection**

09.45-11.15 **Country Cases Part 3 “International Networks and Attractiveness for World Class Researchers”**

11.15-11.45 **Coffee break**

11.45-13.15 **Gallery Walk: Who has to do what to attain world class excellence?
The roles of individual researchers politics, ministries, institutions and EU**

13.15-14.30 **Lunch**

14.30-16.15 **Plenary discussion: 1) Sustainability of WCE policies 2) Implications and effects of WCE policies (segmentation/profiles, side effects, goal conflicts, role of WCE policies within HE policies and steering)**

16.15-16.30 **Wrap-up and goodbye**

Evaluation of Research Units 2007

Coordinator: Claudio E. Sunkel

FCT Unit: DSRICT (Departamento de Suporte à Rede das Instituições Científicas e Tecnológicas)

Responsible officer: Isabel Vitorino

Mandate: Organization and execution of a National Evaluation

Previous evaluations: 1996, 1999, 2003.

Evaluation of Research Units 2007

Organization of the Portuguese scientific system:

- National Laboratories
- Universities
 - Research Units (378)
PhD researchers (8767)
One or more Universities
 - Associate Laboratories (25)
Research Units (45)
PhD Researchers (2659)

FCT Fundação para a Ciência e a Tecnologia

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

Nº	Scientific Areas	
1	MATH	Mathematics
2	PHYS	Physics
3	CHEM	Chemistry
4	BIOS	Biological Sciences
5	EASP	Earth and Space Sciences
6	MAR	Marine Sciences
7	AGR	Agricultural Sciences
8	HESC	Health Sciences
9	CIVE	Civil Engineering
10	MECH	Mechanical Engineering
11	MATE	Materials Science and Engineering
12	CEBI	Chemical Engineering and Biotechnology
13	COMP	Electrical and Computer Engineering
14	ECO	Economics and Management
15	LAW	Law and Political Sciences
16	SOC	Sociology, Anthropology, Demography and Geography
17	EDU	Education Sciences and Policies
18	PSY	Psychology
19	LIN	Linguistics
20	COMS	Communication Sciences
21	LIT	Literature Studies
22	ART	Art Studies
23	PHIL	Philosophy
24	HIST	History
25	AFR	African Studies (new)

All areas of research were covered

3

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MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

Evaluation of Research Units 2007

Methodology:

- Call for evaluation by FCT (April 2007)
- Submission of intent to be evaluated by the Research Unit (May 2007)
- Validation of Integrated Researchers (June 2007)
- Submission of evaluation Report (2003-2006)
- Preliminary online evaluation of the report by the panel
- Site visit to the Research Unit
- Submission of evaluation Report
- Final ratification by the Ministry of Science, Technology and Higher Education
- Notification of the results to the Research Units

4

Evaluation of Research Units 2007

Time line:

- Submission of Reports (July 2007)
- Notification of final Results (December 2008)

Evaluation of Research Units 2007

Evaluation panels:

- 25 panels
- No scientists working in Portugal were included
- More than 300 panel members in total
- Panel size (5-20)
- Some panel Chairs chose to organize thematic subpanels

Evaluation of Research Units 2007

Evaluation criteria:

- Quality not quantity
 - productivity (publications, patents, prototypes, etc)
 - Feasibility of proposed work
 - Internationalization
 - Graduate training
- Research organization (Research group)
- Management of the Research Units
- International standards
- Research Groups (scale 1 low to 5 high)
- Research Unit Overall classification (Poor to Excellent)
- GOOD would be the minimum classification for future funding of the Research Units

Evaluation of Research Units 2007

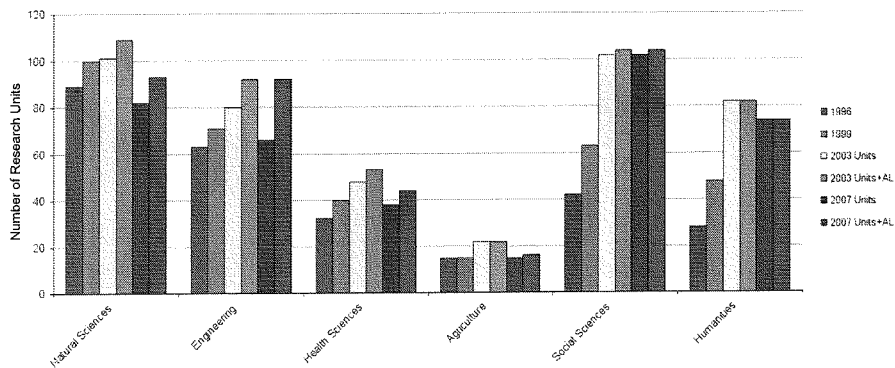
Evaluation criteria:

- Research Groups (scale 1 low to 5 high)
- Research Unit Overall classification (Poor to Excellent)

Classification	Description
Excellent	Internationally recognized outstanding research which contributes to the advancement of the field
Very good	High quality international research which leads to some contributions to the field
Good	Good, solid research at international level leading to incremental contributions to the field
Fair	Satisfactory research which will not necessarily lead to internationally recognized contributions to the field
Poor	Research which is unlikely to contribute to advancement of the field at the international level

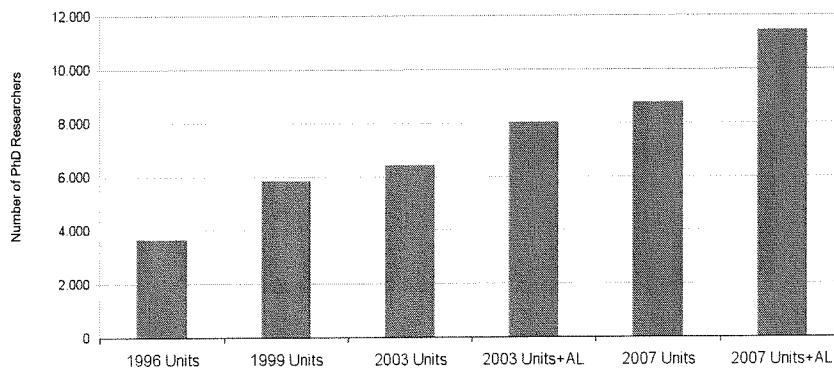
Evaluation of Research Units 1996-2007

Research Units distributed across all fields of Science



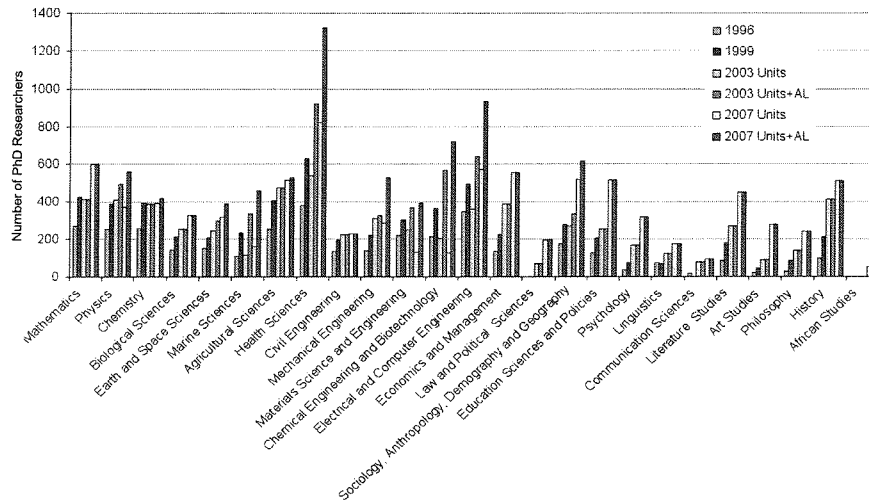
Evaluation of Research Units 1996-2007

Evolution of the number of PhD Researchers (1996 – 2007)



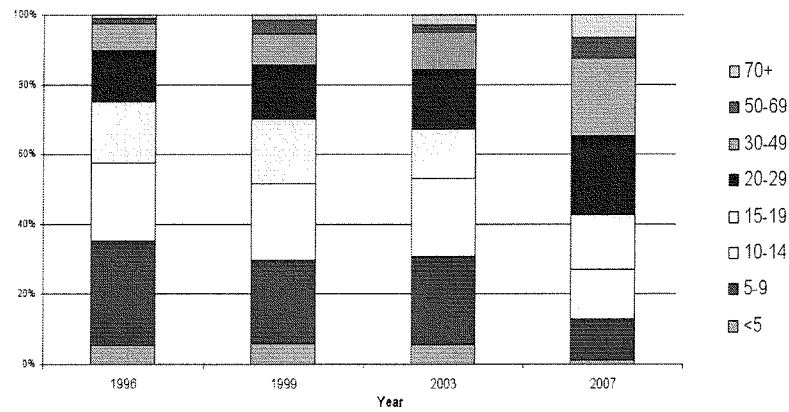
Evaluation of Research Units 2007

Evolution of the Number of PhD Researchers per area of research



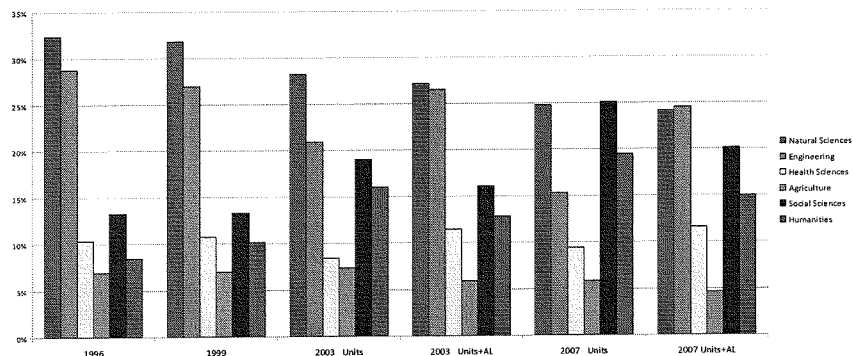
Evaluation of Research Units 1996-2007

Number of PhD Researchers per Research Unit



Evaluation of Research Units 2007

Distribution of PhD Researchers per area of Research

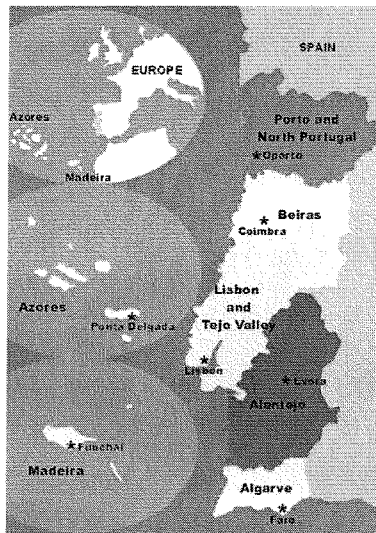


Evaluation of Research Units 2007

Distribution of PhD Researchers per area of Research

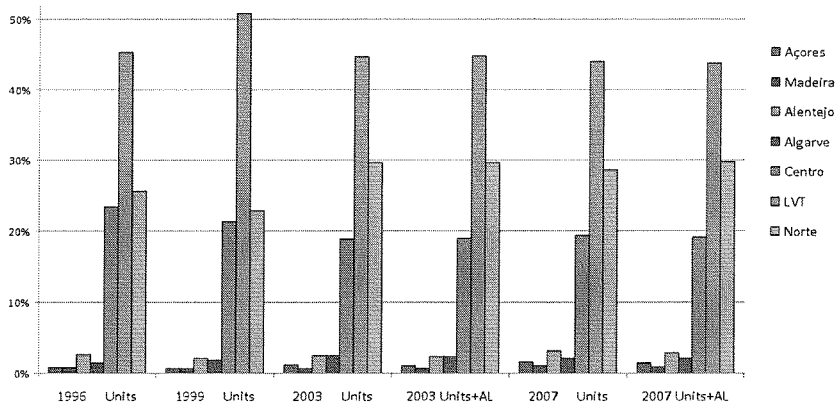
Broad Areas	1996	1999	2003 Units	2003 AL	2003 Total	2007 Units	2007 AL	2007 Total
Natural Sciences	32.4%	31.8%	28.3%	22.9%	27.2%	24.8%	21.9%	24.1%
Engineering	28.8%	27.0%	20.9%	49.1%	26.5%	15.3%	55.1%	24.6%
Health Sciences	10.3%	10.8%	8.4%	23.9%	11.5%	9.4%	18.7%	11.6%
Agriculture	6.9%	7.0%	7.3%	0.0%	5.9%	5.9%	0.6%	4.6%
Social Sciences	13.2%	13.4%	19.0%	4.2%	16.1%	25.1%	3.7%	20.2%
Humanities	8.4%	10.2%	16.0%	0.0%	12.9%	19.5%	0.0%	15.0%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Evaluation of Research Units 2007



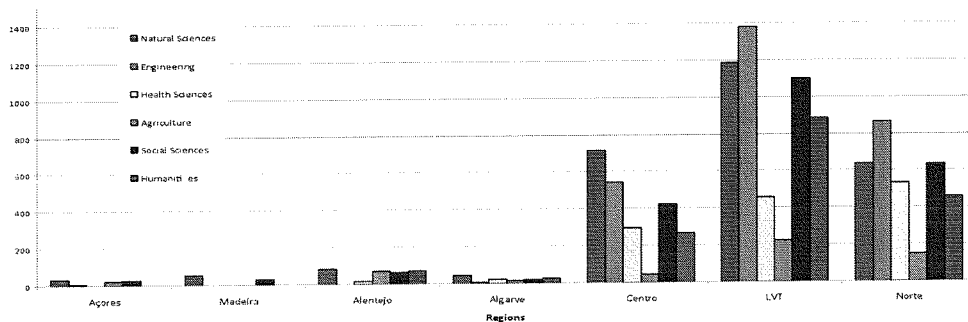
Evaluation of Research Units 2007

Geographical distribution of Research Units

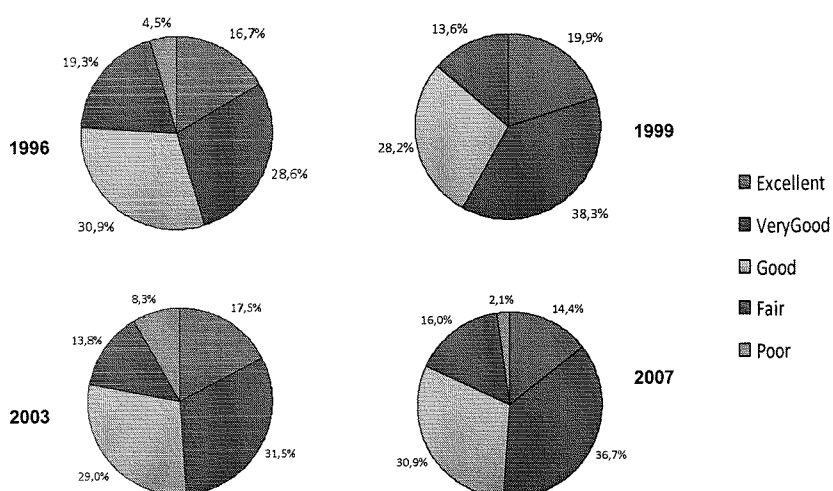


Evaluation of Research Units 2007

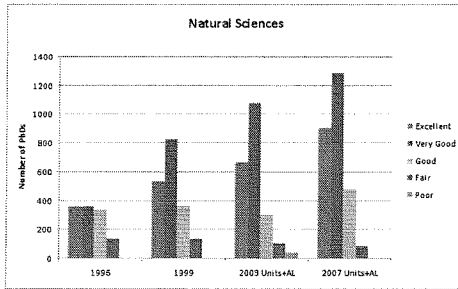
Geographical distribution of areas of Research



Evaluation of Research Units 2007

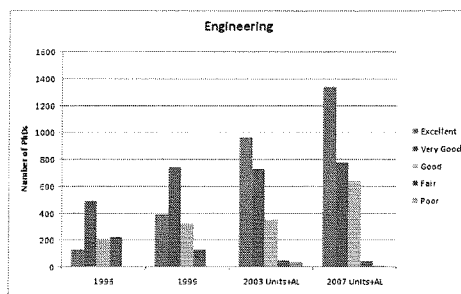


Evaluation of Research Units 2007



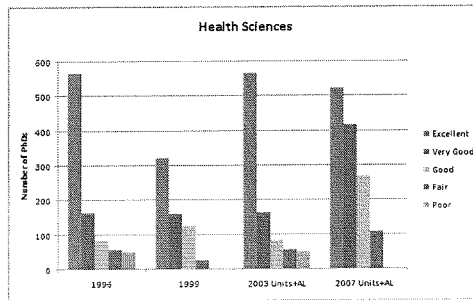
- 24.1% (PhDs)
- Continuous and sustained growth
- Quality of Research improving

Evaluation of Research Units 2007



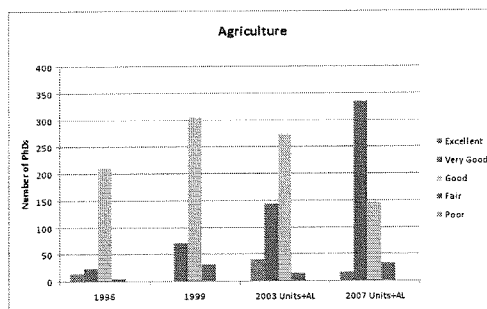
- 24.6% (PhDs)
- Very positive results
- Continued growth and quality

Evaluation of Research Units 2007



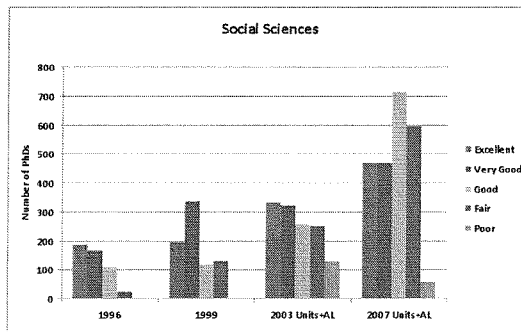
- 9.4% (PhDs)
- Uneven development
- Strong realignment in 2007
- Previous evaluation criteria

Evaluation of Research Units 2007



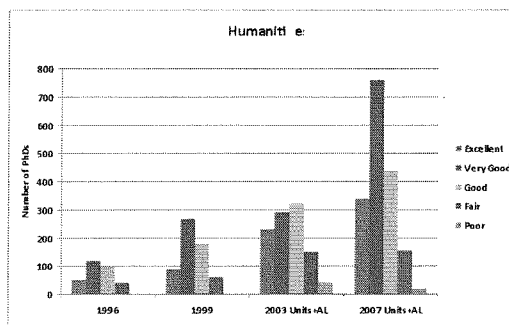
- 5.9% (PhDs)
- Some improvement
- Need to develop much further

Evaluation of Research Units 2007



- 25.1% (PhDs)
- Massive growth
- Needs to promote Quality
- Modest levels of internationalization

Evaluation of Research Units 2007



- 19.5% (PhDs)
- Massive growth
- Quality improved substantially
- Poor levels of internationalization

Evaluation of Research Units 2007


Achievements:

- Many Research Units are now very well equipped to carry out high level research
-Still need to buy new equipment no to loose competitiveness
- Critical mass has grown significantly in all the areas of research (20 PhDs Unit)
-Multidisciplinary still not a major factor in most Research Units
- Significant involvement of Research Units at many levels of society
-Universities, Industry, Local Authorities, Municipality
- Productivity continues to improve and levels of internationalization are substantial
-Need to move from quantity to quality

Evaluation of Research Units 2007

Recommendations:


- **Management:**
Need to define better a general structure for the Research Units that results in a clear mode of organization.
- **University and Research Units:**
Need to define a working relationship between the University system and the Research Units. Duties and Responsibilities.
- **Thematic coherence:**
Need to define specific areas of research so as to focus the work in order to reach higher impact of the results.
- **Renewing leadership:**
Need to promote new and young researchers to take up the future leadership of the Research Units.
- **Postgraduate training:**
Need to define clearly what is the contribution of the Research Units within the postgraduate training of Universities.
- **Productivity:**
While productivity has increased substantially over the last few years, it is essential to promote quality rather than quantity. Research in the Social Sciences and Humanities must promote internationalization.



 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation

PLA on World Class Excellence Lisbon, Portugal - May 2-4, 2010

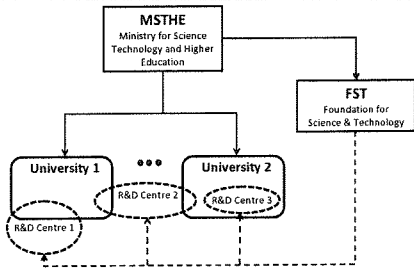
**Opening up Universities
 and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation**


Pedro Guedes de Oliveira


PLA on World Class Excellence
 Lisbon, Portugal - May 3, 2010



 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation

R&D and the Academic System



PLA on World Class Excellence
 Lisbon, Portugal - May 3, 2010




 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation


The University of Porto in numbers

30.000 students
 (= 50% women)

2.300 students enrolled in PhD studies


2.300 teaching staff
 (38% women and 66% holding a PhD degree)


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 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation

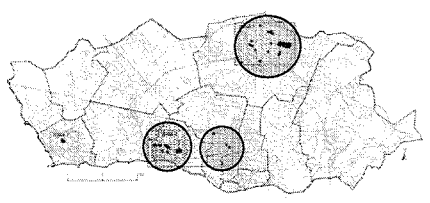
The University of Porto in numbers


3 separate sites in town


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The University of Porto in numbers




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 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation

The University of Porto in numbers

14 Faculties
 1 Business School
 30 Libraries
 12 Museums

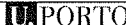
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Opening up Universities and Strengthening Scientific Excellence:
the Case of University of Porto Foundation

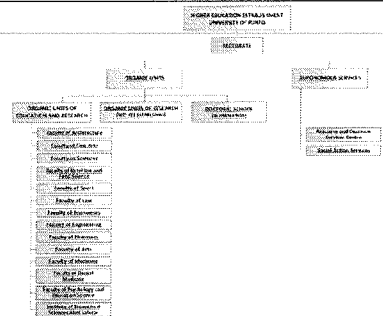
Very heterogenous...

Faculty of Engineering (= 25% UPorto)	The Smallest
7.000 Students	500 Students
500 in Master Degrees	
700 in PhD Degrees	
40 Programs	
12 Undergraduate	1 Undergraduate Degree
8 Master	
20 PhD	


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Opening up Universities and Strengthening Scientific Excellence:
the Case of University of Porto Foundation

The University of Porto in numbers

- 69 Research Units affiliated with UPorto
- 29 R&D Units graded as "Excellent" or "Very Good"
- 14 R&D Units integrated in Associate Labs
- 5.000 Researchers
(of which, 2.000 hold a PhD degree)

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Opening up Universities and Strengthening Scientific Excellence:
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What has thwarted the development of Portuguese Universities

- Poor investment in research
- Inbreeding
- Small number of PhDs
- Poor governance
- Lack of an advanced industry
- Very local intake of students

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Opening up Universities and Strengthening Scientific Excellence:
the Case of University of Porto Foundation

What has been changing

- Increase in the number of foreign students
- Much larger number of young people with PhD degree
- Some improvement in the "quality" of employers requirements
- An increasing interest of young graduates in creating spin-offs
- A significant increase in investment in Science and Technology

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The situation is getting better
and has improved a lot in the last couple of years


ISI-WoS indexed journal publications
Change from 2003 to 2009

Portugal	UPorto
An increase of 95% (annual average increase of 11.8%)	An increase of 128% (annual average increase of 14.7%)

share of national publications increased
from 19% to 22.5%

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Still...

According to the SJTU
 (Shanghai Jiao Tong University)


in 2009 the UPorto was


- in the range 400-500 at the world level
- between 170 and 200 at the European level
- 13th in the Ibero-American world
- 1st (*ex-aequo* with the ULisbon) in Portugal

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... so, clearly, there is still a very long way to go!


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 Opening up Universities and Strengthening Scientific Excellence:
 the Case of University of Porto Foundation

What is moving, now

- New law and new organisation: the GC
- New rules inside the Faculties
- Understanding that competition is at the international stage
- Young and more competitive staff
- Segmentation and stratification (*Doctoral School*)
- External cooperation
 - Between National Universities: *The MAP degrees*
 - Between Universities and R&D Units
 - With Foreign Universities: *MIT, CMU, UTexas-Austin*


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What we do expect

Resulting from the new organisational opportunities
 (Foundation) and improved governance


- To attract the Diaspora
- To implement a private style and rules in management
organisation, governance, financial resources, multi-annual planning
- To attract private money
- To improve HR management and contracting
- To profit from more freedom in career management and salaries
- To improve prestige


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 Opening up Universities and Strengthening Scientific Excellence:
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Main threats

- To insist in a bottom-up culture
- To mismanage the strain caused by the need to change
- The economically depressed situation
- The conservatism of central public administration
- Not to seize the opportunity!

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 Opening up Universities and Strengthening Scientific Excellence:
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Thank you

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MIT Portugal *CREST Peer Learning Activity (PLA)
on World Class Excellence*

*Developing Research and Advanced Training Networks
through International Partnerships:
The MIT-Portugal Program*

Paulo Ferrão

Lisboa, May 2nd 2010


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MIT-Portugal Program

Engineering systems focus: gives emphasis to complex systems that not only have critical technological components, but also have significant economical and socio-technical level interactions, going beyond traditionally defined engineering disciplines.

MPP Consortia involves:

- MIT
- 7 Engineering schools
- 3 Business Schools
- 10 Associated Laboratories
- 3 Industrial Research labs
- 2 State labs



MIT Portugal FCT Fundação para a Ciência e a Tecnologia
RELIQUÍAS DE UM SONHO DE PAÍSES E DE UM CONHECIMENTO

Program Components

Education
New world-class education programs in:

- o Bio-Engineering Systems
- o Sustainable Energy Systems
- o Engineering Design & Advanced Manufacturing
- o Transportation Systems

Research
Portuguese universities are collaborating with MIT faculty in program-affiliated research initiatives, in an effort to stimulate R & D within the industrial sector.

Industry
The MIT Portugal Affiliates Program seeks to engage key partners in industry, foundation and private association sectors to reinforce Portugal's scientific and technological capacity in partnership with MIT.

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PhD and Masters programs

PhD:

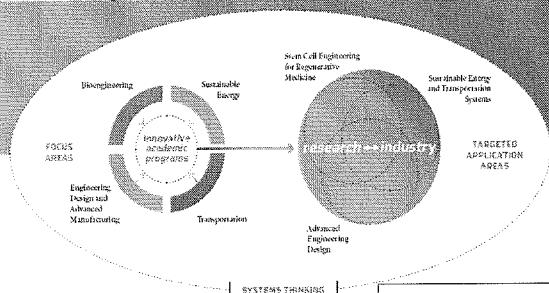
- o 3-4 years
- o 1 year of classes in either modular-intensive or traditional term-length format: varies by program
- o International program: all materials, lectures and activities in English
- o Teaching by Portuguese and MIT faculty (in person and distance learning)
- o Most students do 1 year research at MIT and have MIT co-advisor

Executive Master programs:

- o 1 year programs mostly for professionals

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Our knowledge-creation model



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Objectives

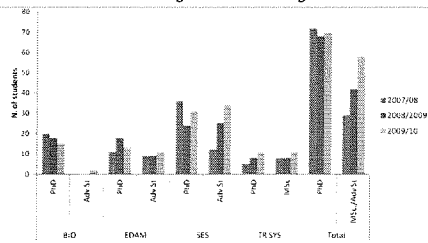
- o Transform scientific and engineering training in Portugal, through a **new research and knowledge network**
- o Invest in **developing human resources** that will help make the vision a reality
- o Cultivate the ongoing development of **advanced methods and models to enhance the value of systems thinking**
- o Demonstrate the advantage of systems thinking in **real-world applications** related to sustainable energy and transportation systems, stem cell engineering, and industrial design that can transform Portugal into an industry leader in these areas

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Students

Total number of current students: 275 (PhD: 210)
Total number of research assistants at MIT (2006-2009): 131

MIT Portugal students in Portugal

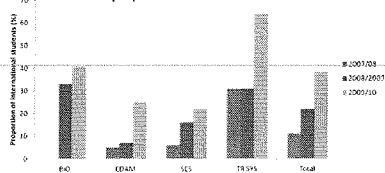


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Internationalization

Overall proportion of international students

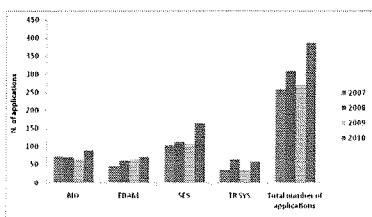


- Proportion of international students has increased significantly over the years and the 2009/10 student cohort is the most international ever: 38% of all the students are international.
- PhD: 41% are international (2009/10).
- MPP students come from 32 different countries.

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2010 PhD Application summary



- This year we have got the highest number of PhD applications ever - 387
- There was a record of applications for all areas.

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Who are our candidates ?

- We have received applications from graduates of several top international universities (TIMES ranking top 200):

BIO	EDAM	SES	TR SYS
Imperial College London Johns Hopkins University University of Aberdeen KTH-Stockholm, Sweden Chalmers University of Technology University of Twente	Imperial College London Georgia Institute of Technology University of Birmingham University of Southampton University of Gothenburg University of Twente Chalmers University of Technology	University College London (UCL) Imperial College London MIT London School of Economics and Political Science Lund University The University of Nottingham University of Southampton University of Western Ontario University of Southern California Eindhoven Univ. of Technology University of Calgary University of Bologna KTH-Stockholm Chalmers University of Technology	University of Michigan Indian Institute of Technology Bombay KTH-Stockholm University of Arizona University of Gothenburg University of Twente

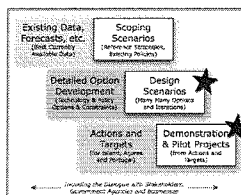
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Azores Green Islands Project



- Three Phase Research Strategy
 - Novel Research Topics Focused on the Integration of New Supply and Demand Technologies, including Storage, Transportation, Efficiency
- Direct Collaboration with the Regional Government and Energy Firms

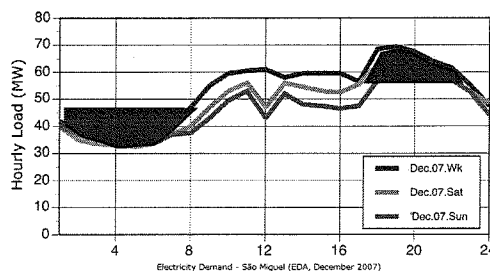


- EDA
- EDP
- Galp
- SGC Energia
- Martifer
- EFACEC
- SGC energia
- others...

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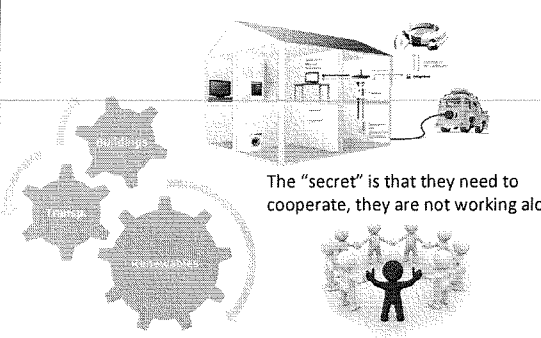
The main challenges




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The opportunity



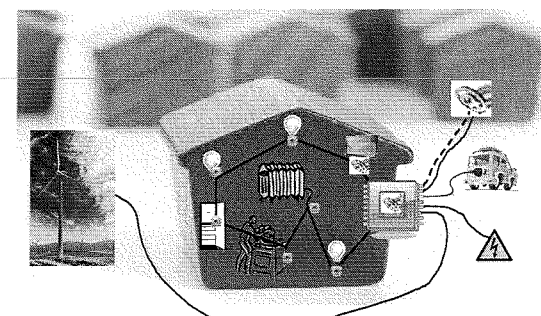
The "secret" is that they need to cooperate, they are not working alone



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REPUBLICA PORTUGUESA DA CIÊNCIA E TECNOLOGIA

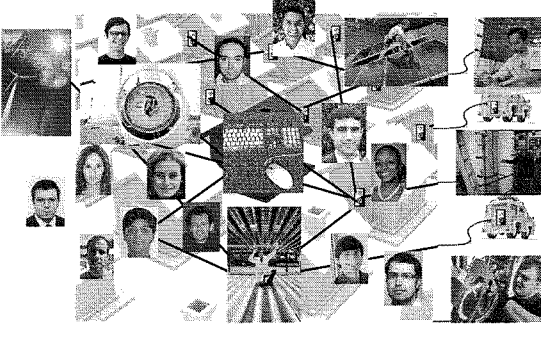
The future – Intelligent Energy Networks, the energy software revolution



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REPUBLICA PORTUGUESA DA CIÊNCIA E TECNOLOGIA

Developing Research and Advanced Training Networks through International Partnerships



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REPUBLICA PORTUGUESA DA CIÊNCIA E TECNOLOGIA

