FINAL REPORT

ERAC's PEER LEARNING ACTIVITIES ON UNIVERSITIES

December 2010

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1. General Overview

Background

In September 2009 the European Research Area Committee (ERAC, the former CREST) mandated Denmark to lead the follow-up on the CREST working group on "mutual learning on approaches to improve the excellence of research in universities". The format for the follow up was defined as a series of Peer Learning Activities (PLA) with a focus on policy instruments and reform initiatives within the research and university area.

The peer learning activities took place over a period of eight months - from January to September 2010. A mid-term report on the progress and first assessment of the PLA method was presented to ERAC in June 2010 and this final report is presented at the ERAC meeting in December 2010.

The report includes an overview of the general lessons learned from the PLA process, an outline of possible follow up activities, and a short summary of the conclusions from each of the PLAs. Detailed information on seminar outcomes is provided in the PLA reports that are annexed to this document (see Annex 2). The report also includes an assessment of the PLA as a method, which has formed the basis for the annexed set of general guidelines for successful PLAs (see Annex 1).

Objectives

The overall objective of the PLA exercise has been to identify ways to support the development of the European Research Area (ERA) through the examination of national initiatives. The PLAs were organized around some of the big challenges Europe is facing in regard to the development of a European Research Area. They are:

1) How to increase global competitiveness of universities?
2) How to develop the potential of the strongest research environments?
3) How to secure and support cohesion across Europe in the field of university performance?
4) How to increase the attractiveness of European research careers?
5) How to ensure an efficient use of scarce research funds?

In the light of these five challenges, five PLAs focusing on specific reforms and policy instruments were organised. In line with the Open Method of Coordination the participating countries shared experiences and exchanged examples of good practices within five areas of university reform:

1) Reform of the institutional structure,
2) Policies to achieve world class excellence in research
3) Capacity building
4) Recruitment and support of early career researchers
5) New models for funding and costing of research activities.

The peer learning activities created opportunities for policymakers, university practitioners and other key actors to engage in case-based constructive dialogue and reflection on current reforms and trends in the European university and research sector with a view to producing a series of thematic reports for wider dissemination.

2. Overview of the general conclusions

The PLAS highlighted a number of key lessons for the enhancement of research quality and the challenges related to the building of the European Research Area.

The European countries have responded to above challenges:

- By reforming their university sector with a focus on creating critical mass and exploiting complementary areas of strength i.e. in mergers, strategic partnerships or clusters,
- By prioritizing funds to research environments with exceptional potential, i.e. investing in excellence and providing funding according to performance
- By starting to create new funding models that enhance responsiveness the political goals for the university sector
- By promoting true cost awareness at both institutional and national level
- By strengthening institutional autonomy as means to support strategic action and sustainability
- By increased awareness of the need for diversification of institutional profiles
- By encouraging the investment in human resources for research both in terms of better quality and higher numbers
- By increased awareness of the importance of enhancing the attractiveness of European research careers, i.e. the framework conditions for researchers' and the improvement of career paths of young researchers
- By encouraging both inward as well as outward mobility.

A number of key messages can be discerned from these initiatives:

- The desire for excellence can be exploited as a reform driver
- International peer review is an integrated part of reform processes in many European countries and this process facilitate a greater common understanding of research quality
- Critical mass and attractiveness are key factors for the global competitiveness of European university research and in this regard political visions and clear institutional strategies are key success factors
- Cluster building and merging are - where implemented - seen as positive drivers of change and quality building
- Structural funds aimed at helping countries to bridge gaps in research quality and performance should act as support to national strategies
- It is important to encourage ways in which to benefit from brain circulation
- A balance should be found between promoting the broader mission of universities towards society and the support of excellence
- Strategies for institutional excellence should have a holistic approach integrating both higher education, research, and innovation (the knowledge triangle)
- The ability of universities to know the cost of their activities is key to their capacity for strategic planning and prioritisation
- National reforms should acknowledge the added value of a European outlook.

3. Focus and outcomes of the five PLAs

Overview of the PLAs

Each seminar was hosted by a Member State responsible for the scope and structure of the topical discussion as the provision of the necessary logistical support and local arrangements. The seminars lasted an average of two days and were open to a maximum of ten participating countries each participating with two peer learners, one representing a governmental agency and one representing the university sector. An overview of the topics, host countries, participating countries, locations and dates is presented in the table below. Further information on the organisation of each event is available on the PLA-website:

http://www.ubst.dk/en/international-cooperation/eu-crest-peer-learning-activities-on-universities.

TABLE 1: Overview of the PLA process

Topic	Host country	Peer learning countries	Location and dates
Reform of the Institutional Structure	Denmark	Austria, Finland, France, Latvia, Malta, Netherlands, Norway, Poland, Romania, Slovenia, Spain , IPTS*	University of Copenhagen, February 8-10, 2010
World Class Excellence	Portugal	Belgium, Denmark, France, Germany (Baden Württemberg), Italy, Netherlands, Poland, Spain, Turkey	University of Lisbon, May 2-4, 2010
Capacity Building	Estonia	Czech Republic, Denmark, France, Ireland, Lithuania, Malta, Poland	University of Tartu, May 17-19, 2010
Early Career Researchers - Recruitment and Career	Ireland	Austria, Belgium, Denmark, Estonia, Norway, Slovenia, Sweden, Switzerland, Turkey	Trinity College Dublin, June 8-11, 2010
New Funding Models: Costing of Research Activities	Spain	Belgium, Denmark, Estonia, Malta, Netherlands, Norway, Poland, Slovenia, Switzerland , IPTS*	University of Murcia, September 6-8, 2010

* A representative from the European Commissions Joint Research Centre, Institute for Prospective Technological Studies (IPTS), participated in discussions at two PLAs.

Besides the above mentioned countries EC representatives as well as leading and host country representatives participated at all PLAs.

The main outcomes of the five seminars are described below including selected country examples. Annexed are detailed PLA reports that provide a more complete picture of the broad range of good practices that emerged during the seminars (See Annexe 2). A major part of the outcomes consisted in findings on good practice in the different countries and therefore the reports provide valuable and comprehensive information for European policy makers as well as for decision-makers in universities.

Copenhagen – Reforming Institutional Structures

The Copenhagen PLA focused on the challenge of increasing global competition for the European higher education and research sector and examined different measures undertaken by peer learning countries for the purpose of enhancing the research capacity and international position of the sector and especially its universities. It looked in particular at mergers of universities and mergers between universities and other public research institutions. It also examined alternative approaches to mergers such as networks and incentive schemes for co-operation as well as central planning models for the reorganisation of the HE sector, for instance by establishing new research institutions.

The Copenhagen PLA identified three main rationales or drivers in reforming institutional structures: search for excellence, competitiveness and efficiency. There are tensions associated with all three rationales and therefore policy choices must consider questions of balance between institutional, national and international levels of engagement, between degrees of co-operation and competition, between accountability to government and autonomy of institutions.

Four types of reform structures were identified among the participating countries. Mergers were presented as a demanding but potentially very effective way of building critical mass and stronger institutions, committing research activities to the development of higher education programmes, creating synergies with the private sector, fostering innovation, specialisation and interdisciplinarity. One main advantage of this choice of reform structure is that university leaders are forced to make an in-depth review of their historical organisational structures in order to position themselves in a global higher education and research context.

Networks were identified as a credible alternative of strategic aggregation that can lead to critical mass and excellence without the significant cost of creating new institutions. Central planning was considered appropriate for system-wide improvement i.e. by creating clusters or centres of excellence. Incentives such as financial rewards are used in Member States to create competitive and collaborative research institutions and were seen as an adequate way to balance bottom-up initiatives with top-down coordination of structural reforms.

Three key conditions for success in the reform of institutional structures were identified as strategic capacity (at both governmental and institutional levels), clear governance structures and appropriate involvement of all actors in the process. The lessons learnt indicated that there was no "one size fits all", but there is a general need for an effective balance in the restructuring process between government initiative and institutional autonomy, concentration of strengths for critical mass, active use of international alliances, and adequate long-term funding.

The most significant example of mergers was Denmark where a recent process had been considered a success both by the government and an international evaluation panel. However, it was considered too early to determine any concrete achievement of objectives for higher performance and excellence. Critical success factors were identified as a combination of strong government commitment to the process, institutional autonomy for institutions to identify the most appropriate merger partners, prior institutional reform of governance, and constructive dialogue between the merging partners, the voluntary nature of the mergers, sufficient funding, and a swift process.

Lisbon – World Class Excellence

The Lisbon PLA focused on the challenge of developing the potential of Europe's strongest research environments and identified prioritisation of funding as a key response. The seminar provided insight into strategic approaches, challenges and opportunities for developing world class excellence. It sought to understand how world class competitiveness could be achieved in a variety of research environments, beyond the sole idea of a "world class university".

While no common definition of "world class" emerged, a number of basic common features associated with world class excellence were identified such as high quality of research output, strong collaboration networks, training and selection of top researchers, international attractiveness, and a lead position in research fields. Furthermore, it was concluded that world class excellence should be seen as an aspiration that can lead to a process for improvement of research quality rather than a specific stage of development.

The seminar highlighted a number of "road maps" for such a process and some general steps towards world class excellence were identified. A first step should be an assessment with the aim to identify the potential for world class excellence. Based on this, strategic investment choices should target specific research units, concentration of talent, access to networks, and institutional development. The country cases showed plausible examples of such road maps.

Four different roads for prioritisation and investment strategies were identified: major investments in a small number of selective areas, development of partnerships with world class institutions at national or international level, attraction of best talent, and reform of institutional structures and governance arrangements.

Sustainability of efforts towards research excellence is a key element for success. This includes choices on the nature and focus of funding, the level of political support and international partnerships as well as robust evaluation systems and international peer reviews to monitor outcomes and set new standards. However, there can be unintended effects of policies for excellence, which lead to goal conflicts with other political objectives (e.g. in higher education) and have implications for differentiation, segmentation and stratification of the higher education sector at large.

Two country examples of prioritisation and investment strategies can be highlighted here. Germany's Excellence Initiative makes major investments in a small number of selective areas to increase visibility and enhance competition. It finances research clusters, graduate schools and institutional plans. Whereas previous competitive research funds supported mainly individual researchers, the Excellence Initiative finances institutions and therefore has had a major impact in improving institutional strategic thinking. It has enhanced (inter-)national co-operation and increased national competition to the benefit of the whole system. Denmark's UNIK initiative seeks to develop partnerships with world class capacity in new innovative research fields by providing universities with investment capital for highly innovative research over a limited five-year period. After the five-year period, successful new structures are integrated into universities' regular budgets. There is innovation in the funding model itself in that it gives significant freedom of use and has kept bureaucratic requirements to a minimum.

Tartu - Capacity Building

In some areas in Europe, there is big challenge in developing the overall system capacity. Until this development has taken place, Europe is not making the most of its research potential and resources located in all of its regions. The creation of a coherent European Research Area necessitates a targeted focus on capacity building. National research capacity is reached when a country is able to prioritize research activities even when faced with limited resources. In Tartu, important overall challenges in relation to building research capacity were targeted. Three main areas for capacity building were given particular attention - brain circulation, strategic organisation of growth and targeted interventions - and a number of measures were identified that would promote their realisation across a wide range of national contexts.

Promoting brain circulation was identified as the more appropriate approach, than brain grain / brain drain discussion. It was recognised that some countries were better placed than others for this and more likely to take advantage of mobile talent. A number of measures were highlighted to promote brain circulation: targeted funding programmes open to international applications, excellence in PhD training, transparent career paths, positive research climate and research freedom, appropriate infrastructure, mobility opportunities and strong general framework conditions for issues such as visas, salaries, insurance etc.

Strategic organisation of growth requires careful management to reach its objectives and maintain sustainability. Strong long-term planning should consider the specific levels and potentials within the country, identify the priorities, set clear objectives and allocate appropriate levels of funding. Investment should be made to serve the strategy, whether at institutional, cluster or regional level and balance should be sought across the different areas of investment. Research priorities should be established through appropriate stakeholder consultation and expert advice. Clear criteria should be set for the allocation of funds and the principles of high flexibility and low bureaucracy should apply to funding from both national and European sources. Greater harmonisation should be sought across these different funding sources to avoid conflicting priorities and rigid administrative requirements and there should be consideration of what role the private sector might play. Setting clear objectives and indicators to evaluate outcomes is essential and international expertise should be sought both in identification of strategies and assessment of outcomes.

Targeted interventions such as the setting up or merging of institutions can maximise the impact of the overall government strategy and must be aligned with the stage of development in the research capacity. It is essential to identify the strategic areas for development that have the potential to produce the desired impact. Furthermore transparent indicators of success and appropriate levels of funding are vital.

Ireland's involvement in the Programme for Research in Third level institutions (PRTLI) co-funded by the European Regional Development Fund provided a useful example of organising growth over a 10-year period with significant investment. Five 2-year cycles, each with specific purposes – institutional strategy, physical infrastructure, collaboration, national strategy and networks - transformed the institutions and the country's research capacity.

Malta demonstrated its way of a capacity building strategy as a small country: developing close collaboration between government, the university and industry in order to overcome potential future skills deficits. Research capacity is built up at the university on basis of national needs and has led to the identification of niche sectors and enhanced co-operation with industry.

Dublin – Early Career Researchers: Recruitment and Careers

The Dublin PLA focused on the challenge of enhancing European research careers and identified a key response in creating attractive, sustainable career systems and focusing on early career researchers. The PLA explored early career researchers' professional development with reference to practices that countries have developed and adopted nationally and/or institutionally to help fulfil the researchers' role in the development of the European Research Area. The discussions centred on the three principal sub-topics of how to enhance researchers' skills and career development, how to improve status and employment conditions and how to ensure transparent research career development. A number of best practices emerged from the different country examples.

Alongside traditional academic objectives for PhD training, the need for systematic integration of transferable skills such as entrepreneurship and project management was highlighted. Such skills should be taught mainly in the initial stages and could be co-ordinated and/or delivered at national or regional levels. While greater structuring and recognition would make the programmes more attractive internationally, it was also important to recognise individual learning needs and ensure that personalised pathways and appropriate mentoring were also available. Co-operation with external partners was identified as a key factor. A stronger role for industry and greater university-industry collaboration could play a significant role in enhancing the employment opportunities of PhD graduates . Country experiences with different partnership schemes showed how industry could be involved in the training process, provide funding opportunities and overcome traditional obstacles between the two partners.

Open and transparent recruitment processes with clear selection criteria and fair procedures were identified as essential. In order to retain talent, it is important to provide funds and improve framework conditions such as competitive salaries, employment security, tenure opportunities, social protection, mobility, family support in addition to providing a creative and innovative research environment.

In terms of career development, transparency was again highlighted as a crucial element in every stage. Researchers should be given greater career guidance and mentoring from the institutions and principal investigators on career opportunities both inside and outside higher education. Early researcher contributions at whatever level should be recognised and made visible. Institutions should involve early career researchers in institutional governance, where appropriate and provide support for researcher organisations.

While career paths across Europe are very diverse, incorporation of the EU Charter and Code was recommended as a means to codify common success factors and create common standards. These should be supported by targeted funding instruments to ensure that promotion of early career researchers is effective.

The participating countries provided a range of examples. In terms of skills and training, Switzerland showcased an interesting model for mentoring whereby PhD candidates are both mentored and learn to mentor others. Norway highlighted active and targeted recruitment procedures during open calls whereby talented individuals are headhunted to ensure highly qualified candidates. Belgium presented a best practice in employment conditions where the researcher status of young post docs entitles to both employee and student benefits. As an example of collaboration with industry, the *Irish Enterprise Partnership Scheme* demonstrated ways of involving industry in the PhD training process.

Murcia – New Funding Models: Costing of Research Activities

The Murcia PLA focused on the challenge of optimising the use of scarce research funds and ensuring sustainability of European universities. Many countries are responding to this challenge by developing balanced and transparent funding models and better approaches to costing of research. The seminar looked at how to organise systems of state funded research and combine the different components of public research funding to ensure coherence; how to implement full costing and cost transparency in the institutions; and how to organise competitive research funding and manage it from an institutional perspective.

There are certain key factors for the success of state systems funding research, such as balance in the policy mix, providing appropriate framework conditions (allowing for autonomy, responsible and effective budgeting, promoting opportunities for the creation of research groups, fostering diversification), and strategic orientation of funding models (having foresight and long term vision, investing in major projects, and providing room for risk).

It was suggested that a reasonable orientation for state funding models in order to balance different objectives, particularly performance orientation and sustainability, would be include three key elements: stable core funding, performance-oriented funding and innovation-oriented funding. The best combination depends on the strategic objectives, suggesting that there will always be inherent tensions in the system. The importance of transparency of the entire system was underlined as well as the wish for simplicity to avoid too much bureaucracy.

Costing is a salient issue for the success of research funding. It is broadly recognized that using a full cost model for external competitive funding leads to more transparency, informs decision-making, enables better choices and motivates cost efficiencies even when full costs cannot be funded. At the same time, there must be room for adopting the full cost principle to the different national situations.

At institutional level an increased awareness of the real cost is important as it enables the management to rational decision-making and strategic planning. Carrying out a cost analysis in universities is a difficult exercise and pragmatic models are needed to calculate direct and indirect project costs. This should not be seen as a deficiency when compared to defining real costs as closely as possible, but rather as an optimal solution in the specific context of research where exact calculations cannot be made. A good example for reasonable proxies is a pragmatic use of time sheets for researchers. Rather than a detailed recording of time, which does not match the total costs approach, time sheet systems should be replaced with simpler recording methods such as calculating percentages for staff in different. A lesson learnt at the PLA was that full cost accounting primarily is to be seen as a tool for improvement of institutional management.

The Norwegian example highlighted the advantages at having all costs accounted for, especially when resources are limited, and being able to make priority decisions. The model aims for simplification and calculates costs in advance so that project leaders need only specify amount of time spent by scientific personnel.

4. Assessment of the PLA process

This section will focus on the second purpose of the PLA process, namely to test peer learning activities as a methodological tool for learning processes and policy making under ERAC.

The evaluation is based on feedback from the participants given at plenary discussions at the PLA seminars, in questionnaires completed at the end of each PLA and from follow-up telephone interviews with selected participants[1]. The evaluation also reflects the impression and experiences of the consultants and representatives from the European Commission and the leading country closely involved in the PLA process.

Evaluation of the overall process

In line with the principles of Open Method of Coordination the term 'peer learning' is in the ERAC mandate defined as "*a voluntary process of co-operation at the European level whereby policy makers and practitioners from European Member States learn through direct contact and practical cooperation from experiences in areas of shared interest and concern.*" The following evaluation of the ERAC PLA process will be viewed from this definition.

Voluntary process

In regard to the voluntary process, the PLA process was initiated by ERAC and it was the members of ERAC who had the possibility and responsibility for informing their home administrations of the PLAs. As a leading country Denmark listed interested countries for each of the five PLAs. As the number of participating countries was limited to ten countries (20 persons) in the mandate, and some PLAs exceeded ten interested countries, a priorisation was necessary. A waiting list was established for interested countries not included in the list of participants.

The processes of getting in contact with the relevant persons in the interested countries have been challenging and time consuming. The agenda for each PLA was prepared on the basis of the experiences of participating countries within the topic area of the PLA. For this reason, late responses from participants and last-minutes cancellations affected the execution of each PLA seminar significantly. Due to EC reimbursement procedures, it was not possible to "overbook" the PLAs to counter the problem.

Format

Before the first PLA was launched a 'strategic plan' was designed describing the organisation, the actors, and their different roles and tasks in the PLA process. Especially in light of the challenge of organising five seminars within a timeframe of eight months, it allowed for continuous assessment and improvement of methods and approaches. The PLA format defined in the strategic plan has been fine-tuned progressively after each seminar. Below is a short summary of the experiences with the format. For further details please see "General Guidelines for Successful PLAs" (Annex 1).

In general a two-day format is considered appropriate. One seminar was shortened to 1.5 days to accommodate flight schedules leaving insufficient time for in-depth discussions. A second seminar was lengthened to 2.5 days and while it did allow for more input and discussion, some participants felt that it was too long and at times repetitive.

[1] Detailed information on the participant's evaluation is available in separate reports.

Two further key elements for success are logistics and moderation techniques. Peer learning activities require the right space and equipment to be successful. Employing interactive exercises also requires moderation skills in time-management, especially ensuring energy levels of participants are kept high, as well as in extracting meaningful outcomes from the various inputs. Providing opportunities for participants to exchange information in informal settings such as the coffee and lunch breaks or dinner events were highly appreciated by participants. These moments further contributed to building the group identity and encouraging more open exchange.

Throughout the PLAs different formats of peer learning, other than presentations, were used such as "Card Collection" where individual ideas are collected, grouped and represented to the participants for group discussion under the emerging themes; the "Gallery Walk" where ideas are brainstormed and gathered on specific questions in small groups; case studies where solutions to specific issues are sought in small groups; structured plenary sessions for exchange of ideas and best practices; peer consulting where solutions to specific issues were discussed in small groups. In general the evaluations show that participants appreciated the climate of trust that was developed in the small group and particularly enjoyed the range of interactive peer learning exercises.

PLA roles

The **leading country** planned the overall programme and ensured continuity throughout the five seminars. It chaired the co-ordination meetings, contributed to the preparations of each seminar including close contact with the participating countries, provided input and gave approval of the country reports and the final report.

The role of the leading country has evolved from the planning of the process to the finalization of the PLAs. Looking back the role as leading country has been more time consuming than predicted, i.e. due to the above mentioned difficulties in getting in contact with the persons with relevant experiences in the countries that initially expressed interest in participating in the PLAs.

The **host country** attended the co-ordination meeting, elaborated the strategic planning paper for each PLA and proposed the agenda. It was responsible for all the logistical aspects involved with the event (venue, accommodation, social events etc) and took care of participant registration and queries. It provided significant contributions to the programme and co-chaired the seminar with the moderator.

The role as host country has been important for the successfulness of each PLA. There were a number of people in different countries involved in the organisation of each event and key to the positive outcomes was their willingness to work together in a very practical manner identifying problems and seeking solutions in the interest of the task at hand. A strong team spirit played a fundamental contribution to the overall success of the PLA seminars. The costs of being a host country have been extensive – both in time and in money.

Among lessons learned are that it is an important incentive for a country to host a PLA that it can set the specific focus of the subject and the overall programme including guest speakers. The communication between the host country and the leading country has also shown to be important as experiences from former PLAs were passed on this way.

The **Commission** supported the process economically by reimbursing the participants according to EC-rules. Besides representatives from the Commission were vey helpful in the various PLA stages i.e. ensuring co-ordination with the ERA processes. They gave advice at the co-ordination meetings, participated in the seminars and provided input for all documents, from the strategic planning papers to the final report.

The **lead consultant** provided input in the various stages of preparation and realisation of each PLA seminar, both in terms of content and selection of the peer learning exercises, acted as co-chair and moderator during the seminars and provided input and supervision for the reports. The other two expert consultants were responsible for the production of all the reports and provided support to the host countries in the planning stages and in organising the contributions from the participants. The engagement of consultants has been indispensable for the process as neither the leading country or the host country have been able to provide sufficient resources to write the report drafts or moderating the PLAs.

The **peer learners** were relevant policymakers (ministries or equivalent) and practitioners from universities chosen on the basis of their ability to make a contribution to the specific topic from their own professional experience. In general for each PLA a balance of homogeneity and heterogeneity of background and experience were sought.

Prior to each PLA, participants were provided with information about the seminar and their role and requested to carry out two tasks. Participants were asked to send information regarding their own country case/situation as well as prepare a presentation for the PLA. This enabled the agenda to be constructed according to the themes, creating some degree of commonality between diverse country approaches.

Participants appreciated the climate of trust that was developed in the small group and particularly enjoyed the range of interactive peer learning exercises. Their evaluation shows that country facts could have been distributed better on beforehand allowing for the presentation to be less 'fact-oriented' and more focusing on the countries specific challenges. Furthermore, participants' feedback on the composition of the group shows that some PLAs had too much imbalance in the knowledge levels of the participants and / or in the policy situation in the different countries, which at times limited the benefits of knowledge exchange for some participants.

5. Benefits of PLA

In order to put forward general conclusions on the PLA-process , the benefits of the PLA process should be viewed in relation to the outcome for the individual participants, impact on Member State Policy, Impact on EU and EC policy, and last but not least outcome for the broader public.

Outcomes for individual participants

In general the participants expressed high levels of satisfaction with the usefulness of peer learning as a method and the vast majority stated that their expectations had been met or surpassed. Participants assessed the seminars as successful in creating an opportunity for open and mutual exchange of information and providing a broad overview of reform trends and initiatives in a range of EU countries. Even those participants who could be considered "net givers" in view of their background in countries at more progressed stages of reform found the discussion of core concepts and the new contacts they made useful and worthwhile.

Many of the participant recommended that this type of event (PLA) should become standard practice for knowledge exchange and international cooperation in the area of higher education and research policy. Their recommendations for future PLA seminars are indicated below in the section on follow-up activities.

Impacts on national policy

It is too early to determine whether there has been any impact on member state policy but the participant's comments indicate a significant potential impact for the future. Many indicated that there had been useful learning in the exchange of practices, that a number of informal exchanges had taken place with colleagues in the ministries and universities, and that the PLA reports, available on the website, would be useful in future strategy discussions.

Informal networks have also been established through the process and a number of participants indicated that they had already been in touch with colleagues in other countries or intended to do so in the near future.

Impacts on EU/EC policy

The presence of Commission expert officials at all the PLAs provides an opportunity for the outcomes to be disseminated in other events as well as to inform policy frameworks and funding choices at EU level.

The results of the PLAs have already been taken up in several conferences, first during the Spanish Presidency conference on *'Universities 2020'* in June 2010 where the preliminary results of the PLAs were presented. In October 2010, the PLA-process and results were presented during the opening session of the Belgian Presidency Conference on *'Conditions for achieving Excellence in Universities and other Research Organisations'.*

The Working Group 'Skills' of the Steering Group for Human Resources Management also took note of the PLAs and included the interim results both in their work on the Framework for Research Careers which was launched early October 2010 for public consultation and in an ongoing mapping exercise on doctoral schools which will be finalised by the end of 2010.

Besides DG EAC is organising a PLA on the institutional structure of the European Higher Education Institutions, where the ERAC PLA-process and way of organising is a role model as well as the results from the PLA in Copenhagen is taking into account. Furthermore the planned Communication on Modernisation of Universities in 2011, under the lead of DG EAC will draw on the PLA series as source of information and validation as well as use the former participants for consultations.

Outcome for the broader public

Dissemination of key messages and best practices is foreseen via the website – where all reports are uploaded – as well as through the foreseen publishing of the final PLA report. The website, www.ubst.dk/en/international-cooperation, has so far had 6000 digital readouts and the average time spend on the website is 1:35 minute, which indicates that the information is actually read. The feedback given by PLA participants in telephone interviews after the end of the PLA series made clear that they used the website as their single most important source for the wider distribution of the PLA results.

The shifting location of the PLA activities has created some degree of public awareness of the EU policy discussions locally / at a national level. However, the long term effect for the broader public can be seen as a contribution to the general development of the European university sectors as well as the overall European university reform agenda.

6. Perspectives and follow-up activities

The PLAs have provided successful outcomes both in terms of individual learning and contribution to policy development. The participants benefited greatly from the discussions and the outcomes documented in the reports and internet materials are of interest to a larger audience. The PLA process as documented above can serve as a guideline for future PLAs. It can be considered a successful experience and experiment and it is recommended to continue the development of PLAs as an instrument in the context of the open method of coordination.

As outlined in the beginning of the report the 2010 ERAC PLA process have been organised around some of the major challenges for universities in the European Research Area. Though the PLA process has shed light on a number of policy initiatives undertaken in the Member States in order to respond to these challenges there are still areas of interest within the European university and research sector that with advantage can be discussed in a European context. The following list of topics is based on discussions throughout the PLA process and the evaluation interview with participants:

- *How to organize institutional diversity?*
  The outcome of the PLAs shows that there is a broad understanding among the European countries of the need for further diversification of the university sector. Europe needs universities with different profiles that serve multiple stakeholders at regional, national and global level. How to develop systems that support this?

- *How to promote world class excellence and at the same time secure the universities broad pledge to society?*
  In relation to the discussion of excellence, it was stressed that the universities broad pledge to society should be sustained while supporting excellence. European policy makers have a tendency to compare the European universities with the universities in the U.S. However, it is important to be aware of the differences between the European 'plateau-university-model' and the U.S. stratified model. Is the main challenge for Europe to increase the top or to improve the sub-top? European policy makers should be aware not only to focus on the top excellence. Europe has a unique higher educational system with an overall good quality of the entire system. This needs to be sustained.

- *How to better integrate research, innovation and higher education?*
  Higher education and innovation aspects should be integrated in countries' and institutions' strategies towards excellence. In a knowledge society research should not be isolated neither from innovation nor from education.

- *How to organize the co-operation between the public research sector and the private sector, incl. models for cooperation, intellectual property and technology transfer?*
  The majority of European universities are publicly financed. In order to enhance quality and growth in the sector a diversification of universities' income streams is needed. There is a need for discussion on how to facilitate further private investment in universities without questioning the independence of research and teaching – i.e. challenges in the area of intellectual property rights, technology transfer and models for collaboration.

- *How to ensure that Europe has sufficient people with the right training to tackle the challenges of tomorrow*?
  Many countries are developing policies to better match higher education programs with societal needs. Exchange of experience on how to do so would be highly relevant.

- *How to integrate institutional autonomy and interests of society?*
  Many European countries move towards increased institutional autonomy for universities. Exchange of experience on methods to keep autonomous institutions accountable to the needs of society is asked for.

- *How to compete and co-operate – at the same time?*
  The growth in the significance of competitive research funding and performance based financing in most countries' university sector highlights the importance of supporting collaboration across institutional barriers where relevant. A debate on how this can be facilitated is in high demand.

Throughout the PLA process the focus on responses in university reform to the challenges of ERA has proven extremely beneficial. As the list above reflects, the focus on universities as a key institution for developing the ERA naturally entails an exploration of the relation between objectives and policy measures connected to all sides of the knowledge triangle – research, education, and innovation. The debates at the individual PLAs have highlighted universities as institutions that integrate the overall ambitions for the ERA and the centrally of these institutions for the further development of research and innovation policies in the European context.

The coherence and quality of Europe's response to global challenges in the field of university reform is a key to our competitiveness as a global region. Peer Learning Countries clearly underlined the potential benefit of fully embracing a wider European outlook in designing university reforms. The ERAC Peer Learning Activities on Universities presented itself as an effective instrument for moving in this direction.

ANNEXES

ANNEXE 1 General Guidelines for successful PLAs

Actors

In addition to the role of the European Commission and the lead country, there are the roles of the host countries and the external consultants. A host country should take the responsibility to find an attractive and suitable site for the PLA and follow through with all the necessary seminar arrangements (accommodation, catering, seminar facilities etc). External consultants can with advantage be used in preparation of content, moderation, and documentation of results.

There should be a contact person at host institution who works with the organizers and/or consultants. The tasks include producing any necessary documents, making all the local arrangements and communicating with the participating countries once registration opens.

Composition of the group of peer learners

In order to initiate discussions it should be aimed at a certain degree of heterogeneity among the peer learners. In the ERAC PLA the peer learner came from both ministries and universities. On the other hand, certain homogeneity is also important i.e. by securing that the participants are chosen on the basis the basis of their ability to make a contribution to the specific topic from their own professional experience.

The number of participant should not exceed 25-30 persons in order to secure active participation and allow the time for all peer learners to present or give feed back on presented country cases.

Location and accommodation

Workshop locations should be in major cities or cities with good international airline connections as this will have a direct influence on the willingness of participants to travel. Where possible, hotels should be within walking distance of the seminar location or bus transport should be provided.

Seminar rooms

Rooms should have a space which promotes dialogue, which ideally means tables arranged in a square or circle. The room should have a flat (not sloping) floor with moveable chairs and tables to allow for different formations according to the different exercises. Traditional lecture halls or amphitheatres are not suitable.

There should be flip charts and pens available and it should be possible to attach large sheets of paper to the walls of the room so that the different outcomes from the exercises are visible throughout the seminar. If group work is planned, a number of smaller break-out rooms should be arranged.

The room should be equipped with computer facilities, ideally with internet access. There should be a sufficient number of extension cords to enable participants to use their laptops . Since most European countries use two-pin plugs, adapters should be made available in countries with three-pin plugs (UK and Ireland).

In addition to (readable) name badges, name boards can be used in the room to facilitate people getting to know one another more quickly and provide support for moderator in identifying participants and countries.

Breaks and catering arrangements

There should be sufficient breaks to enable participants to refresh as well as to engage informally with one another. Ideally, there should be a break every two hours. Morning and afternoon breaks should last 20-30 minutes and the lunch break an hour. Buffet-style refreshments should be provided at all breaks to ensure efficient use of time and greater interaction. If a restaurant is booked for lunch, then sufficient time should be allocated to accommodate the local arrangements. There should be access to water throughout the seminar.

Social events

It is recommended to organise a networking dinner to open the event where participants can register, collect information and meet one another over a meal. It is worthwhile considering either a round of introductions or some other form of networking activity to ensure that as many people as possible have had a chance to identify and/or meet the other participants ahead of the actual seminar. This can be organized at the hotel where the participants are staying or at a nearby restaurant that latecomers can reach easily.

On the second (and usually last) evening, participants appreciate the opportunity to experience the local culture and if time allows a cultural event or tour can be organized ahead of the dinner. However, it is recommended to include a break in the programme at the end of the day to allow participants to rest or refresh before the evening activities.

Programme

The programme should be carefully calibrated to keep energy levels high throughout and avoid information overload. Presentations should be broken up into themes and inserted over the two days of the seminar and interspersed with a range of different interactive exercises. A highly interactive exercise, such as the Gallery Walk should be inserted in the first half of the first day to give participants an opportunity to get to know one another and exchange information in small groups.

Time management is essential to keeping the programme on track and all activities (including evaluation feedback) should be clearly indicated in the programme with a precise time slot. A chair or moderator should be responsible for time-keeping. All peer learning activities should be explained clearly and supported in written (PPT or handout) format.

Participant input

Participant selection criteria should be defined and distributed to those agencies responsible for identifying the most appropriate representatives either at ministerial or university level to ensure that they will be able to contribute meaningfully and participate actively in the seminars. Facilitation of this process is time- and resource-intensive and needs to be started well in advance of the seminar.

Those participants identified for the seminar require clear and detailed information on the nature of a peer learning seminar and of the contribution they will be expected to make. Once initial information has been sent on the role of the peer learner, precise instructions should be communicated on the type of input and related deadlines.

If country information is required in order to complete the programme, a short feedback form should be sent with a small number of questions requesting specific information. This should provide the organizers with sufficient detail to identify the different sub-topics for the seminar and to allocate the countries in groups accordingly. It should also highlight stages of development and examples of best practice that can be requested for presentation.

On the basis of the feedback information, the organisers can provide the participants with instructions for the presentation they are to make at the seminar. It is highly recommended to maintain regular contact at this stage either via email or phone to ensure that participants have understood the instructions, are moving forward with the task at hand and are able to meet the various deadlines.

It is worthwhile considering a general template either showing the type of information that is provided on a slide by slide basis or a set of questions to be answered in the presentation with an indication of a maximum number of slides for the time available. The presentation should contain minimal contextual information and focus on good practices and/or challenges. If general country information is deemed necessary, it can be provided in a separate handout to be circulated to participants. Participants should have a clear indication of the length of their presentation and be expected to present within the time limit.

A typical presentation might cover the following structure and 1-2 slides on each point would be sufficient:
1. What? - a short description of programme/project
2. Why? - initiative-specific context, reason for establishment and objectives
3. How? - implementation: process and results
4. Examples of good practice
5. Challenges and possible solutions

Such guidelines should facilitate the participants in their preparations and ensure clearer focus and easier comparability during the seminar. Given the number of participating countries and the various stages of development in the particular topic being discussed, it is worthwhile considering whether all country presentations should be organized in the same manner or whether a different format might be more suitable for those countries that do not have specific examples of good practice, e.g. a panel discussion on challenges or open questions.

Peer learning activities
A range of different activities should be used during the seminar and should match the type of outcome that is sought in the particular exercise. The activities should move participants physically and ensure they are interacting with as many people as possible. Techniques that proved to be successful were the card collection, gallery walk, case studies, group tasks and peer consulting. Further information on how these were organised is available in the peer learning evaluation reports.

Role of moderator
The moderator plays a key role in the different stages of discussion and should have a clear agenda and structure for each session to ensure the realization of the different types of outcomes expected. He/she should be able to steer the discussions in the right direction and keep the group on topic as well as accurately summarizing content and drawing preliminary conclusions

Outcomes
The results of the various activities highlighted that there are four general types of outcomes that can be generated from a PLA and examples of each of these can be found in the country reports.

Typologies and goal-instrument relations: Comparing the different policy approaches in the participating countries it was possible to identify specific types of instruments, policies or strategies and how the different types are linked to specific goals. The country examples are a good starting point to identify relations between a certain objective and the instruments that can be used to achieve it.

Success factors: The PLA participants highlighted special features of their policies and instruments which were (starting to be) successful in enhancing research capacity in the universities. If these features prove to be successful in different national contexts, they can be considered general success factors.

Good practice examples: The country examples often led to the conclusion that a specific process or policy could be regarded as good practice in the specific context of that country.

Common understandings: In some cases it was possible to draw general conclusions from the discussions and reach a common understanding among the participants concerning a special definition or conceptualisation of a research policy for research.

Documentation and publication of results
It is recommended that a website should be created for dissemination of information and results to the participants and to a wider audience. After each seminar, the presentations should be made available as quickly as possible and once the reports highlighting outcomes are completed, participants should be alerted to the website posting.

Summary Report of Peer Learning Activity 1

Reforming institutional Structures

Copenhagen, February 2010

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1. Introduction

1.1. Context and challenges

Global shifts

The role of research is shifting at a global level as universities are expected to contribute more strongly as active players to the development of the knowledge society. Developing research excellence and attracting global talent has reached strategic importance in national policies for higher education and research. In an increasingly competitive climate, policymakers are implementing reform measures that lead to the restructuring of the higher education and research system or to the development of new units with the objective of promoting research excellence, creating greater capacity in the sector and fostering innovation.

European initiatives

Calls for a stronger European contribution to the global production of knowledge through an improvement of both quality and quantity of research output in higher education and research institutions are central to the European Union policies (Modernisation Agenda for Universities, Strengthening research institutions for the achievement of ERA) and have been reaffirmed in their most recent developments and perspectives (EU 2020 Strategy)

Challenges

There are a number of factors that have been identified as preventing European universities and public research institutions from performing at a competitive level in the new environment. In general, these are summarised as lack of elite sector, lack of critical mass, lack of focus of research agenda and fragmentation through both the number and size of institutions, as well as unclear institutional governance structures.

Changes

In response to these challenges, there has been a recent shift in European policies for reform of higher education structures through approaches such as governance reform, merging of institutions, development of new collaborative inter-institutional network structures and the creation of new research units.

1.2. Focus

The focus of the Copenhagen Peer Learning Activity (PLA) was an examination of the different measures undertaken in institutional structure reform for the purpose of enhancing research capacity and profile. It looked in particular at how mergers have been carried out between universities as well as between universities and public research organisations, as in the case of Denmark which was the host country for the event. But other approaches, such as networks, incentive schemes and central planning models to coordinate and concentrate research capacities were also examined via the various participant country cases. The comparisons between different contexts highlighted the need for certain preconditions and good practices in order to reach the desired results, but also drew attention to the need for further investigation and development of new models to respond to a rapidly changing global environment.

2. PLA structure - Working method- Participating countries

Structure

The PLA was organised as a two-day event 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 by Professor Peter Maassen from the University of Oslo on reform of institutional structure as a means to enhance research quality and on different country approaches to fostering Organised diversity' in their research and higher education systems. This was followed by a series of presentations on the 2007 Danish merger process from both Danish government and university representatives, addressing governance reform and mergers as tools for improving the performance of the sector. The afternoon session was dedicated to short presentations from the participating countries that provided further examples of tools for reform and highlighted critical areas as well as best practices. This enabled a preliminary set of conclusions to emerge on reform types, reform objectives, benefits and drawbacks and appropriate steering instruments.

The structure of the second day was built around a number of group activities aimed at stimulating further discussion and analysis and focusing on topics that had emerged on the first day. A plenary discussion concluded the event where overall conclusions were reached and outstanding questions identified.

Working method

Peer learning was the working method chosen for the entire process consisting of five separate activities on different aspects of improving research capacity and it was the first time that the methodology was employed for a CREST workshop. Peer learning is a voluntary process of co-operation whereby policymakers and practitioners from the member states can learn from one another through direct contact and sharing of experiences, interests and concerns.

In order to ensure mutual learning both through an exchange of information and networking, a range of peer learning activities were used to enable all participants to contribute actively. These included exercises such as Gallery Walk (a small group activity to brainstorm and collect ideas), Card Collection (a collection of individual ideas followed by group discussion), Working Groups (problem solving in hypothetical scenarios) and plenary discussion (open, group exchange of ideas, comments and questions).

Participating countries

There were eleven countries present at the meeting: Austria, Denmark (host country), Estonia, Finland, France, Latvia, Malta, Netherlands, Norway, Poland, Romania, Slovenia and Spain. There was representation from the Nordic Council and European Commission and the three external consultants had moderator and rapporteur roles.

3. Reforming institutional structures

3.1. Rationales/Drivers for reform

The different country presentations highlighted three main rationales or drivers for the reform of institutional structures in the new environment:

1. Search for excellence (international impact of research, access to top research networks, interdisplinarity and innovation, creating links between excellence, research and teaching)
2. Competitiveness (critical mass, institutional branding and profiling, greater international visibility for countries as research and higher education locations, stronger external engagement and joint activities with the private sector, ability to attract funding and researchers)
3. Efficiency (organisation of diversity in the higher education and research sector, reconciling institutional strategies with government policies, rationalisation and improved use of resources, sharing of expensive infrastructures and joint training centres, more effective division of labour, better links between research and teaching).

Whatever the rationales or drivers for reform, a number of tensions became apparent that were common to most countries. The various policy choices faced the challenge of balancing national and international priorities, matching both national and institutional objectives and finding the right combination of competition and co-operation. Difficult decisions had to be made on determining appropriate levels of critical mass and specialisation as well as institutional size and profile. Careful consideration had to be given to developing synergy between education and research, and funding choices had to be made for both excellence and equity. The right balance between accountability and autonomy had to be found in order to enable central steering and direction while creating the conditions for more independent and responsive institutions to emerge in a less strictly regulated environment.

3.2. Typologies

Different types of institutional reforms were described in the presentations according to the different objectives. Some countries chose reorganisation within existing institutions by opting for policies for consolidation and reallocation, while others opted for more focused investments leading to the creation of new institutions, units or segments. The different policy options highlighted were mergers, networks, strategic planning and incentives. While mixed models were common for different types of institutional reform, it is nevertheless useful to identify the different typologies in order to reflect on whether policies meet their objectives and to analyse the benefits and drawbacks of different policy options.

Mergers

Mergers were presented by Denmark as a tool for creating critical mass, stimulating innovation and strengthening institutions in order to achieve higher levels of performance and excellence. They were identified as a means to enhance synergies with the private sector, foster specialisation and interdisciplinarity as well as enhance institutional management capacity for complex projects. The possibility to foster critical mass among smaller research units and the potential for bringing formerly isolated research resources into play in university education were highlighted as major

Reasons contributing to the success of the 2007 Danish merger process were identified as the firm commitment of the government (research strategy as part of a national strategy for globalisation), reformed governance structures within the institutions, constructive dialogue between the partners and the voluntary nature of the mergers (including the bottom-up choice of the right partner by the institutions themselves), the underlying trend of growth in public funding for the sector and a swift and comprehensive process.

It was highlighted that while the mergers were considered to have been successful by both the government and a recent international evaluation and had been important drivers of change in the universities, they are nevertheless extremely resource-intensive both in terms of time and costs. Since full implementation will take several years, it was too early to determine any concrete outcomes but initial positive developments were reported.

Mergers appeared as a trend in other countries as well. Norway, Finland and the Netherlands are all introducing mergers and highlighting the importance of finding the right balance between top-down and bottom-up processes that ensure institutional commitment. Slovenia is also considering mergers as part of its planned modernisation strategy for the system as a whole.

Networks

Networks (including clusters, alliances and other groupings) at both national and international levels were identified as a means to develop joint activities that could lead to excellence and critical mass without creating new institutions. The institutions themselves are not changed, but parallel, collaborative institutional structures are created, that can also involve international partners, leading to the development of a more complex system. They offer opportunity for strategic aggregation at different levels (schools, disciplines, institutes etc.) and when they develop clearly defined rules of co-operation, are well-managed and sufficiently funded, they are flexible structures that have the potential to create innovation, build relations with the socio-economic environment and enhance response capacity to societal needs. They can also be used as a tool for institutional profiling and branding provided they are operating according to international standards.

Networks can be encouraged as a top-down initiative and supported by government funds. However it is essential that these are properly co-ordinated and managed to ensure such loose frameworks are able to produce results. Projects managed by networks require a clear plan with funding linked to specific milestones and an efficient but flexible monitoring system if goals are to be reached and unpredictable events are to be dealt with.

Examples provided in the presentations included a Dutch project for a federation between three technical universities that is supported by government subsidies to attract top academics to five joint research centres of excellence. The Federation was created in response to pressures to merge technical universities and while initial targets were met further integration is dependent on external subsidies and there appears to be little support within the universities. France has allocated specific funds for the development of excellence clusters (campuses and laboratories of excellence) as well as a number of thematic projects in areas such as biotechnology and health. Finland plans four to five strategic alliances between universities and polytechnics with a special focus on joint R&D with regional impact.

Structured co-operation between institutions can also be seen as a way to test possible merger opportunities. Currently, there are a number of co-operations between universities and *hogescholen* in the Netherlands that may lead to mergers in the future.

Strategic Planning

Strategic planning to reform institutional structures was identified as a tool to achieve system-wide improvement, organise system diversity and create strong centres of excellence. Structures could be affected in different ways: the number of institutions could vary through the creation of completely new institutions targeted at research excellence or the relative size of institutions could change if specific units with outstanding research performance are selectively promoted.

The integration of strategic planning of education and research into the national strategy for development was noted as a key element for success. It requires strong strategic planning processes at national level. On the one hand, there must be clear vision and direction as well as clear roles for the different actors, but success also depends on the top down and bottom up process of co-ordinating national and institutional strategies. Lack of ownership at institutional level will jeopardise successful outcomes.

Strong core funding was highlighted as essential to secure long-term strategic focus at institutional level although it may also run the risk of becoming a driver for homogeneity as institutions align strategic direction with the areas where most funding is available.

A number of countries, such as Austria, France, Latvia, Malta, Poland, Romania and Slovenia have recently introduced or are in the process of designing major strategic reforms to upgrade the entire higher education system and raise levels of competitiveness, although some also highlighted the challenges of budgetary restrictions. Measures to enhance institutional autonomy, encourage private sector collaboration and align with international standards and practices were highlighted. A shift towards more results-based funding and performance contracts was also apparent.

In general, research strategies tend to focus on concentration of resources in a smaller number of institutions, as mentioned by Latvia, or on the selection of leading research centres that will receive additional funding, as in the case of Poland. Austria has set up a new research institution as a centre of excellence with the goal of increasing national visibility as a research location. Malta, with only one university, seeks to create critical mass in those areas identified as strategically important for the economy.

Incentives

Incentives are a special policy type to reform institutional structures. Governments do not prescribe a specific form of institutional reform but offer financial rewards for creating competitive research institutions. This form is open for all types of institutional changes and ttherefore leaves high autonomy to the institutions, promoting both creativity and diversity. It provides a stimulus to address the issue of institutional change with the specific purpose of promoting research excellence and has the potential to improve strategic capacity at institutional level.

In Norway, most research is carried out in three major universities and it has opted for a policy of building on its existing research centres rather than creating new "lighthouse" institutions while also inviting universities to seek partners for mergers.

While diversity of funding sources may encourage diversity of responses and act as a driver for institutional diversity, a model based on incentives raises the question of sustainability and how long-term capacity of universities to meet societal needs are secured in such a system. Incentives are probably more effective in the long term when linked to other typologies.

Finland has opted for a mixed model approach, combining mergers, strategic planning and incentives for the purpose of enhance innovation and competitiveness as well as régionalisation and internationalisation. It has changed the legal status of universities to make them legal entities that are separate from the state while retaining state responsibility for funding. Mergers have led to the creation of new universities and polytechnics. Regional impact is being enhanced by steering public research institutions towards research that addresses societal needs and by strategic alliances between universities and polytechnics.

Policy choices and challenges

It emerged in the presentations that policy choices are very much context-driven and that there is no standard recipe for successful reform that could be applied across the different systems or that could guarantee a certain outcome.

It also became clear that the reform of institutional structures were at different stages and took different forms in the countries represented at the PLA. For instance, in some countries instruments to enhance competitive and output-oriented steering models are the focus of reforms and institutional structures are only starting to change, whereas in other countries fundamental restructuring is taking place. Countries were starting out from a variety of different positions in terms of efficiency of higher education systems and levels of research capacity.

Whichever reform tool or combination of reform tools was chosen, they identified a set of potential benefits and drawbacks. The following table gives an overview of some of the arguments mentioned by the participants during the PLA interactive sessions, especially the Gallery Walk.

This table provides illustrations of the debates but does not necessary reflect the conclusions of the discussions.

	BENEFITS	DRAWBACKS
MERGERS	• Greater international visibility and branding • Opportunities for excellence • Potential to develop new interdisciplinary / innovative units and programmes • On the long term, rationalisation helps cost reduction • Less fragmentation and duplication • Potential to reduce competition and increase cooperation among similar institutions	• Large units may lose flexibility • Implementation is crucial (potential insecurity in the transition phase; issue of successfully matching institutional cultures • Risk of increase in bureaucracy and inefficiency • Challenge of cultural differences between institutions • Legal and financial complications • Costly process (time and resources) • Risk of loss in equity and access
NETWORKS	• Opportunity for strategic aggregation at an appropriate level (schools, disciplines, institutes etc) • Fosters international co-operation • Tool for institutional profiling/branding • Can help to build relations with socio-economic environment (industry, government etc) • Improves capacity to respond to regional/global needs • Provides flexibility • Improved division of labour if clear rules are in place	• Lack of formalization can lead to unclear roles /inefficient division of labour • Over-formalization can lead to increased organisation costs • Unclear planning compromises realisation of objectives • Co-ordination can be time consuming for lead institution • Can lead to closed "clubs" • Creates a more complex HE landscape
STRATEGIC PLANNING	• National strategy provides clear direction • Sets objectives at macro-level and provides stronger steering • Creates specific targets for institutions • Can be linked to incentives	• Risk of lack of ownership/commitment at institutional level • Risk of over-regulation and micromanagement • May be seen as threat to autonomy/diversity • Requires strategic planning competences at central level
INCENTIVES	• Creates push factor without need for central planning • Aligns institutional strategies with national policies/priorities • Promotes creativity and diversity • Market driven responses • Fosters institutional motivation • Can promote/consolidate institutional strategy	• May generate artificial reforms • Uncertainty of outcomes • Risk of institutions following short-term incentives without longer-term planning • Risk of creating dependency

3.3. Suggested key conditions for success

When engaging in a process of reforming institutional structures, the general principles of strategic management and clear governance structures are key to the successful achievement of the expected outcomes. This requires capacity to understand the environment, develop clear priorities and define a long-term vision that is supported by a well-articulated strategy and underpinned by a sustainable funding model. Alongside steering instruments and incentives, there should also be appropriate accountability measures and quality assurance mechanisms that do not inhibit initiative and innovation.

Secondly, the involvement of the different actors in the merging process plays a fundamental role in ensuring successful outcomes. Dialogue and consultation with stakeholders should be utilised to the full to ensure shared commitment and co-operation. A balance of central government control and institutional autonomy further ensures higher likelihood of successful outcomes and can lead to cross-fertilization of governmental and institutional strategies.

Leadership plays a fundamental role in driving the process and maintaining the momentum to reach the goals but should also have the awareness of the many reform challenges, either in terms of length of time required to reach reform objectives, resource constraints or resistance to change.

A more complete list of best practices for structural reform that emerged during the peer learning activity of "Card Collection" are presented in the table below.

Examples of Best Practice for Structural Reform

	Examples of Best Practice for Structural Reform
Strategic basis at national level	• Sound environmental awareness and analysis • Clear vision • Clearly defined strategy, goals and expected outcomes • Awareness of the challenges and risks associated • Strong central commitment • Clear responsibilities of all reform actors • Shared understanding and open dialogue with the stakeholders • Broad understanding of potential stakeholders • Promotion of reforms leading to strategic aggregation, specialization, critical mass, internationalization • Realistic deadlines and deliverables (balance between driving process forward and time required for results) • Efficient monitoring of results • Strong communication of reform intentions, benefits and expected outcomes
National framework Conditions	• Stable framework conditions • Strong political momentum • Appropriate funding and investments at least for the duration of the reform • Clearly defined incentives • Sufficient support at all levels (legal, financial, strategic) • Streamlined administration and minimum bureaucracy • Genuine institutional autonomy (legal and financial) for flexible responses • System-wide quality assurance • Avoidance of reform for reform's sake, or for purely financial reasons
Governance	National level: • Stakeholder consultation and involvement throughout the reform process • Reform process based on co-operation with visible advantages for all players • Balance between accountability and autonomy • Balance between top down and bottom up (avoid forcing reform on stakeholders or relying on reforms developing spontaneously at institutional level) Institutional level: • Clear mechanisms for collective action and co-ordination • Strong leadership at all levels with clear mandates • Identification of change agents within institutions • Creation and maintenance of legitimacy for actors of reform • Visibility for role models • Promotion of positive attitude and cultural change
General considerations	• Reform measures that can be realistically achieved by the Higher Education Institutions (strategic capability, governance arrangements, funding availability, institutional cultures) • Consideration of best practice models (but adapted to local context) • Diversity of measures for different educational levels • Connections between teaching and research • Promotion of wider function of universities • Promotion of institutional diversity • Definition and diversity of excellence • Consideration of European and international context

3.4. Outcomes and lessons learnt

A number of lessons were learnt from the different country experiences in introducing reforms of institutional structures to enhance research capacity and quality.

1. The first lesson concerned the search for an effective balance between the system level need for order and the institutional need for autonomy. The various reform measures sought to reach or readjust the balance between the two according to the different national contexts, but the degree of central government control and institutional autonomy remained a principal underlying issue. National policies seek ways to strengthen global competitiveness by granting sufficient autonomy to enable institutions to set their own strategic priorities, while seeking at the same time to ensure adequate accountability that does not inhibit initiative or thwart innovation and guarantee a degree of organised diversity between university missions and profiles.

An appropriate balance of top-down measures is important to ensure diversity of institutional types as well as the necessary contribution to teaching and innovation by research institutions. The existence of autonomous institutions will not necessarily lead to the creation of a diverse institutional landscape. The valorization of diverse relevant approaches towards excellence is also essential.

It is not yet clear whether research quality is most effectively stimulated through central control or through institutional autonomy, or whether responsibility for research quality lies with the institution or at central level. What does emerge as important is an open dialogue and co-operation between the two players to ensure that both are working in the direction of creating a system that is flexible enough to respond to new challenges. This was highlighted in the Danish case where the government tool provided the clear direction of institutional mergers but left ample scope to the institutions themselves to determine the choice of partners and the scope of action. They also identified an important balance between a swift implementation process and sufficient time for results to be achieved.

2. The second lesson drew attention to the need to ensure a concentration of strengths in research and research training in order to create the critical mass. This was related both to a need for stronger relationships between research and teaching, the need to develop centres of excellence and elite institutions ('lighthouses'), build up an appropriate workforce and exploit opportunities for interdisciplinarity. Concentration of strengths implies concentration of funds in a small number of institutions and priority areas. This raises the question of the relationship between top universities and the other universities in the system, since there can be no elite system unless it is supported by mass higher education, and no adequate mass higher education can emerge without the development of an elite structure, not only in research and innovation but also in all university functions such as teaching, lifelong learning, community outreach and so on. Finding the right balance is key to the success of the reform and will depend essentially on the needs and capacities of the local context.

3. The third lesson highlighted the importance of the international dimension in the reform strategy in terms of setting of targets for profiling based on the international impact of research, achieving international visibility as a research location, attracting global talent, gaining access to international networks and funding, as well as aligning with international standards and performance measurements. However, the question was also raised as to how international commitment and collaboration can be balanced with the regional focus. An apparарent lack of

urgency in the participating countries to establish mergers or close institutional collaboration across national borders also emerged at the PLA. The establishment of competitive institutional structures seems to be understood mostly in a national context, which may hinder dialogue on the development of competitive structures in a wider European context.

4. The fourth lesson pointed to external engagement with the private sector to stimulate joint structures, develop synergies, encourage innovation, build up critical mass and diversify income sources. External engagement was highlighted as key if European research were to be internationally competitive but also to ensure that the universities were able to respond to societal needs.

5. The fifth lesson showed the importance of adequate long-term funding to underpin the policies, invest in infrastructure and build up appropriate capacity in human resources. In the new state-university relations, there is an increasing tendency towards more contractual and performance-based allocation of resources, but this must also be understood in a long-term perspective given the time required to develop world class research units. Such funding structures should also take into consideration the considerable time lag between allocation of funding and achievement of structural reform.

Critical factors
As in any change process, there are risks of resistance to change, change fatigue, cultural clashes and disagreements. Moreover, mergers can lead to the creation of large institutions that might foster exaggerated competition. Such critical factors should be taken into consideration when introducing long-term, far-reaching reforms that will significantly alter the institutional landscape. It should also be remembered that while choices may be made for the development of new modes and models of institutional structure, it is also essential to ensure improvement of existing structures. Critical and complex issues can be managed through open and frequent dialogue with stakeholders, regular feedback and monitoring (both reporting and discussion-based), transparent evaluation, and adequate follow-up measures.

Outstanding questions
The PLA raised some questions that did not find adequate responses in the interactions between peer learners. The first one concerned the longer-term effects of major reform policies, such as mergers. Since all of the reform measures discussed have been implemented only recently (and in some cases are only in the design stage), there has not yet been sufficient time to assess outcomes and level of impact on the system. Another question concerned international mergers and all the major legal and possibly cultural implications that such projects carry. In general, while co-operation was identified as a key reform instrument, it is not clear which type of co-operation, with which partners and under which conditions will produce the best outcomes or in the case of mergers, what is the optimal size of a university to achieve the desired results.

The issue of internal measures during and after the merger processes was also raised: how to ensure people work together successfully and how to identify the most effective synergies between research units to ensure a positive outcome and sustainable operation. While a merger begins as a formal act, it is the institutional policies and people that have to bring it to life. Ways to overcome cultural differences between former separate institutions have to be identified and implemented or success of the merger may be jeopardised.

Questions were also raised about funding priorities not only at institutional level but also in terms of the different disciplines; in particular the issue of defining the role of humanities and social sciences in promoting research excellence. It was also questioned whether all types of research necessarily benefit from large units or clusters and what the implications were for individual research funding. Diversity was a recurrent theme and it was affirmed that diversity within the institutional landscape is a fundamental requirement. Consequently, profiling of universities should be both vertical (diverse levels of excellence) and horizontal (different typologies and missions). However, the means to achieve dual profiling remains an open question.

Lastly, the need for the development of competitive structures at European or cross-national level was not addressed in depth. Most reform initiatives address the national context, but a discussion of institutional reform in a wider European context may be necessary to address competition between Europe and other world regions more effectively.

4. Evaluation of the PLA method

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.

Participants considered that there had been a climate of open exchange and that the size and composition of the peer group had provided opportunities for fruitful and informative discussions. Overall, they felt that a two-day meeting was an appropriate length, that the event was well organised and the content of high quality.

A few areas for improvement were identified. Participants felt they required more information prior to the event in order to prepare more successfully (more guidance on presentations to provide clearer focus) as well as more time for discussion and interactive exchange during the event. It was suggested that interactive exercises could be introduced at an earlier stage to enable participants to engage more directly with one another and create stronger cohesion.

5. Conclusions and perspectives

The first PLA on Reforming Institutional Structures confirmed the need for strong action to enable European universities to overcome current shortcomings in the higher education systems and to ensure greater competitiveness in European research at a global level. It highlighted the diversity of responses across the participating countries according to local contexts in terms of capacity and ambition. But it showed that all converged on the need to modernise the higher education and research system in order to enhance capacity and improve responsiveness to a rapidly changing global environment. It further pointed to the need to achieve some form of organised institutional diversity, while the means to both define and achieve diversity need development.

The different tools examined - mergers, networks, strategic planning and incentives - had both advantages and disadvantages and needed to be carefully chosen according to the specific objectives of each country. There was no single recipe that guaranteed success and given that all countries are in the early stages of reform, there were not yet any definite conclusions that could be presented. However, it was also for this reason that the PLA had provided a timely moment for reflection.

Summary Report of Peer Learning Activity 2

World Class Excellence

Lisbon, May 2010

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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 roles as moderator and rapporteur.

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, and 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 summaries 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
Individual researchers / research groups	***Career*:** Make an active decision for a research career, ensure lifelong training, find time to ***do*** research ***Internationalisation*:** Be mobile, teach (internationally), , build international partnerships and disseminate research results (internationally) ***Co-operation*:** Have an open attitude and connect to other researchers, attract the best, co-operate with complementary researchers ***Competition:*** Compete for resources, aim to be the best ***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)
Institutions / leaders	***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 ***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 units ***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)
National governments	***Strategy:*** Set the national goals towards "excellence" Reform governance for autonomy and accountability Provide framework strategy Balance academic interests with economic/industrial needs ***Funding and facilities****:* Opt for selective financing 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) ***Accountability:*** Ensure proper regulation Set up control mechanisms (transparency, accountability, evaluation, simplicity in reporting, etc.) but not by the government directly

European Union	***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 WCE, peer review, performance indicators, accountability) ***Funding:*** Provide seed money Employ very specific funding instruments (ERC, etc.) mixed with broad instruments Move money from agriculture to research ***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 ***Accountability:*** Support, assess, interact, reflect Reduce administrative requirements for FP programmes (copy NSF standards - a post evaluation).
Other actors	***(Private) foundations, charities, non-profit organizations*****:** Provide awards, promote mobility, provide infrastructure, and bring about new strategic initiatives. ***Funding agencies*****:** Provide policy role through funding instruments, science assessment, control against academic inbreeding ***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) ***Research funding councils:*** Provide and support transparent mechanisms for competition; members need to become international but there are language issues.

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	
Financial stability	Sustainability of research institutes, universities Long-term personnel and maintenance of structures
System stability	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
Timeline	Clear timelines Long-term thinking
External engagement	Co-funding from external sources Involvement of companies Concentration of start-ups and spin-offs from the university
Framework incentives	Transparent peer-review system with financial consequences Criteria of excellence in university funding schemes Target agreements on business plans

Research staff	Policies for retention Attractiveness for talented students and researchers, both home and abroad Increased internal internationalization of universities Promotion of research careers
Management	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 my 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.
    a. world class excellence implies perfect autonomy and flexibility for the best individuals (e.g. career grants in the Netherlands);
    b. world class excellence requires adequate structures and institutional strategies (e.g. investment funds in Denmark);
    c. 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:
    a. 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.
    b. Partnerships with world leaders: a comprehensive approach for education, research and innovation should be adopted if partnering with leading institutions is intended
    c. 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:
    a. The degree of focus varies (systems with few large investments or with a multitude of investment pools for different purposes)
    b. 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 ail.

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.

Summary Report of Peer Learning Activity 3

Capacity Building

Tartu, May 2010

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1. Introduction

1.1. Context and challenges

Global shifts

The competition to ensure a strong position in the global knowledge economy is motivating countries around the world to invest in higher education and research institutions. This agenda is being carried out differently according to the needs and goals as well as the market forces of each country, ranging from the necessity to build up a system's overall research capacity to the interest in developing specific endeavours to target key areas. Nonetheless, in all cases, both guaranteeing a solid base in research on the one hand, and the possibility to develop innovative, cutting-edge research on the other remain areas of high priority, with the balance between the two depending on the system's overall research capacity. Even in countries where policy makers are most interested in boosting the potential of their nation's research profile, and where there may already be in place successful brain circulation policies, a modern research infrastructure, effective funding mechanisms, and forward thinking strategies for skills enhancement and human resource management, there is nonetheless a constant concern for renewal of the research system's capacity. The building up of this capacity is never a finished task on the policy agenda. No matter at what "stage" a country may be in building up its research capacity, all countries are perpetually faced with areas for improvement, often paralleling the evolution of research needs and societal priorities.

European context

In Europe, there is a large variation between countries' needs for research capacity building. Approaches are also varied, but for the ERA agenda to move forward, capacity building is viewed as an essential area to develop in order to bring the multitude of different national research profiles across Europe to a more level playing field, in particular for those countries with less advanced capacity building measures. Though more of a priority in some countries than in others, all are dealing with the challenges and opportunities of building capacity in ways which are specific to their country contexts, whether they are building up from scratch, renewing their system or specific infrastructures, or maintaining their current status.

Building up research capacity across Europe remains a key requirement in order to globally compete with other regions around the world. In some countries, the overall development of the research infrastructure and policies promoting research excellence are needed. In others, where there already exist a solid research infrastructure and long-term research capacity policies, there is a greater need for policies that will improve research performance and upgrade the quality of a country's research system. Catering to both needs is important for the strong development of the European Research Area. The ERA 2020 Vision states that, "Utilising fully their research potential, all European countries and regions are building on their strengths while maintaining or gaining access to complementary specialised knowledge and S&T capacities in the rest of Europe."[2]

More recently, the building up of research capacity is noted as playing a key role in fostering economic recovery from the global economic crisis and in potentially acting as a catalyst to stimulate innovation and competitive performance. The Europe 2020 Strategy notes that in order to achieve the targets for increased economic growth, efficiency and sustainability, "a greater

[2] European Research Area Vision 2020, European Commission, December 2008. See: http://ec.europa.eu/research/era/pdf/era_vision_2020_en.pdf

capacity for research and development (...) will improve competitiveness and foster job creation" (p.9).[3]

To a large extent, previous historical context and financial conditions dictate the measures being employed across Europe to build up research capacity.

1.2. Focus

The importance of building up and maintaining overall research capacity is clear when considering that it is a fundamental requirement for a strong, flexible, dynamic and competitive research system. As the "nuts and bolts" of building a strong system, a certain level of capacity needs to have been developed before concentration on policies oriented towards autonomy/competition or targeted interventions can be implemented. In addition, it must be continually re-assessed and improved for higher education and research institutions to maintain an edge on research and innovation.

The building up of research capacity can be achieved by implementing a research policy which focuses on the development of the research infrastructure or on the overall improvement of research performance ability. Developing the research infrastructure or improving research performance can be achieved in a number of ways, including fostering human capital and skill enhancement, supporting funding mechanisms, building infrastructures, attracting researchers from abroad, and developing governmental and institutional strategies. In the PLA, the human resource and the infrastructure aspects of capacity building were regarded as equally important.

Though all countries employed measures to build up research capacity, there was a wide variation of the measures chosen and the level of success experienced. For the purposes of the PLA workshop, on the basis of consultations between the host country, lead country, European Commission representatives and consultants, three main topics were selected for special focus:

- Brain circulation. One of the most important success factors for capacity building is the circulation of human resources in research, leading to the continuous improvement of human resource quality.

- Organisation of growth. To manage growth is not an easy task; it has to be organised in a rational expansion process with adequate steps.

- Targeted interventions. With a view to maximise the impact of government intervention, questions of where to invest, with which objectives, how to generate impact, how to ensure sustainability of investment, etc., need to be addressed.

In the context of these topics, peer learning countries revealed design options for and features of their brain circulation policies, planning steps and key ingredients for the optimal organization of growth in research capacity, and special, high-impact initiatives (often State lead) with specific objectives for research capacity building.

[3] Europe 2020: A European strategy for smart, sustainable and inclusive growth. March 2010. European Commission, Brussels.

2. PLA structure – Working method – participating countries

Structure

One and a half workshop days were dedicated to this Peer Learning Activity, including a pre-event networking dinner to make initial contacts and provide a first opportunity for networking. The decision to allocate less time to this PLA than to the previous ones (which had lasted for 2-days) was based on the need to experiment with different workshop lengths in order to see which might be the most conducive for meaningful networking and exchanges during the peer learning activity sessions.

The welcome address opened the morning session of the first day, highlighting the importance of linking capacity building to national economic resources and of linking university research with industry needs. The morning session continued with an introduction to the PLA event by the European Commission with special emphasis on the fundamental link between research and innovation and an explanation of how peer learning helps to draw up the strategies necessary for a coherent EU approach supported by a backdrop of national policies. A description of the PLA method and focus followed, presented by the lead country, Denmark.

The keynote speech focused on competitiveness and knowledge production, addressing the reasons for inadequate capacity for knowledge production and slow RDI capacity growth, the problem of brain drain, tradeoffs between human capital and infrastructure-oriented strategies, and the role of specific interventions. Following the keynote speech, more details about the Estonian case emerged through a presentation on the purposefulness of financial instruments, including the Estonian particularities of being very “e”-oriented and of probably having the fastest growth in R&D volumes in the EU. Two further presentations followed on capacity building in environmental technologies and on the successful case of the overhauling of veterinary medical academic education. For the latter, the idea of using the Estonian example to help other ex-Soviet countries integrating into Europe is worthy of note. The morning session ended with an interactive activity (Gallery Walk) whereby participants reflected upon and responded to the question of what has to be done for capacity building in research in the context of human capital/skill enhancement, developing infrastructures, funding, attracting researchers from abroad and of developing governmental/institutional strategies. Participants also identified problems or failures in these different contexts.

The afternoon focused on country presentations that had been organised around three topic clusters of brain gain, organizing growth and special, targeted interventions to increase research capacity. Each topic was organised around an identical format of ten minute presentations of two or three country examples, followed by a question and answer session, a plenary discussion and then a summary of lessons learnt, recommendations and outcomes.

The second day opened with an examination of what participants considered to be the major lessons learnt about capacity building for research following the first day’s discussions. The last round of country presentations, which focused on targeted interventions, ensued. A re-visit of the Gallery Walk activity allowed for further ideas to be developed and included in the contributions made on the first day’s morning session. A plenary discussion of remaining open questions and a final set of outcomes closed the PLA session.

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. This mutual learning approach was chosen in the context of applying the Open Method of Coordination to research policy and as the working method for all five CREST PLA events examining different ways in which national reforms can improve university research performance. Each event focuses on a specific issue, namely, mergers and reforms of the institutional structure of national research systems, world-class excellence in university research, capacity building, recruitment and careers of early-career researchers, and the costing of research activities. The Tartu PLA in Estonia was the third event.

Based on the previous experiences of the first two PLAs in Copenhagen and Lisbon, the interactive tools and the structure of the country presentations were improved upon in order to best ensure efficient information exchange and worthwhile mutual learning. The Gallery Walk was scheduled earlier in the workshop timetable as a warm-up activity in order to create a closer cohesion of the group sooner on the first day. It was meant for brainstorming and for an initial collection of ideas in small groups, followed by plenary discussions for an open, group exchange of ideas, comments and questions. A new feature was added to the Gallery Walk whereby participants had the opportunity to re-visit the initial list of ideas near the end of the workshop, adding on relevant discussion points and adjusting for overlooked nuances. The Card Collection was employed in order to gather individual ideas and provide group discussion. It was also scheduled so that a link could be made between the first day's outcomes and the opening of the second day's session. Thus, it had a dual purpose of collecting ideas for discussion and providing a refresher of the previous day's events. 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 nine peer learner countries present at the meeting: Czech Republic, Denmark (leading country), Estonia (host country), France, Hungary, Ireland, Lithuania, Malta, and Poland. There was representation from the European Commission and the three external consultants had moderator and rapporteur roles.

3. Capacity Building

3.1. What has to be done for research capacity building?
In order for capacity building in research to be successful and efficient, a number of aspects need to be considered. A clear understanding of the roles and responsibilities of the different stakeholders was signalled as an important criterion, in particular, increased communication and exchanges between academia and industry as well as increased funding from national and European sources. More specifically, the Gallery Walk asked the question of what has to be done for capacity building in research in the context of human capital/skill enhancement, developing infrastructures, funding, attracting researchers from abroad and developing governmental/institutional strategies. It also asked whether there are problems or failures in these different contexts.

The outcomes of the Gallery Walk are presented in the following table.

QUESTIONS	CONDITIONS	FAILURES/PROBLEMS
What has to be done for human capital/skill enhancement?	Support the Researcher Career • Provide a clear understanding of expectations, roles, responsibilities of the researchers • Promote the professor's position • Understand that a talented researcher does not necessarily equal a talented teacher and put in place measures for teacher training • Create an individual focus/career portfolio system • Ensure promotion routes are transparent and attractive • Put in place the structures and supports to enable skill enhancement • Provide flexible learning to up-skill • Support measures for lifelong learning • Support competitive salaries • Promote internationalisation, such as inter and cross-border exchanges • Professionalize science management • Market science in primary schools to gain more interest among young people in the researcher career Promote Industry Involvement • Foster the involvement of industry in academia's activities • Develop infrastructure for discussion between industry and researchers • Promote the value of the PhD to industry	Improve Skills and Training • Improve the basic education level and skills level of general research education • Ensure better training of professors/lecturers (all levels) • Promote improved training and development to enhance capacity for strategic management and research Other • Avoid initiatives aimed at specific nationalities that are interested in only attracting the best researchers/professors • Provide more skills forecasting to inform employees and employers about future skills needs and education institutions on skills demands
What has to be done to attract researchers from abroad?	Work on Systemic Issues • Promote favourable legislation • Provide adequate funding Improve the Quality of Researcher Life • Provide good infrastructure and facilities • Offer pleasant and well connected surroundings • Focus on improving the quality of everyday life (including schools in English) • Provide reasonable terms of living • Allow the freedom to lead the development of a chosen research area • Provide good reliable career prospects and attractive opportunities Provide an Attractive Institutional/Research Setting • Have a good reputation of the team and institution, including branding • Develop a niche area of expertise • Endeavour to reach the ideal of the "open" university • Organize big scientific events • Develop some networks on several international research programmes • Provide academic freedom and national doctoral schools and centres of excellence • Develop and use appropriate marketing schemes to promote the research team/institution	Find Solutions to Immigration and Social Protection Issues • Solve immigration and visa problems, etc. (including the poor implementation of the 3rd country visa directive - scientific visa) • Try to eliminate the inequalities and discrimination/distortions encountered by foreign researchers compared with local researchers • Simplify complicated tax laws for foreign researchers Limit Restrictions/Obstacles • Curb bureaucracy • Find solutions to language restrictions for foreign researchers • Endeavour to overcome cultural differences Other • Promote social networks abroad • Eliminate poor research climates

What has to be done to finance capacity building?	<u>Promote R&D</u> • Foster marketing of R&D • In a welfare competition (what is most important: the patient or the student?), demonstrate the outcome of R&D development to the public <u>Accept Aid from Outside Sources</u> • Philanthropy • Trust funds • Receive donations from industry • Develop effective tools to attract private funding (eg. through taxes) • Tax breaks for institutions • Commitment by government to support institutions in attracting EU funds – co-funding not taken from core mission (teaching and research) <u>Have a Long-Term Vision</u> • Ask the questions: When is the goal achieved? How to ensure sustainability? • Focus on long term benefits, incl. basic values • Build critical mass <u>Promote Cooperation</u> • Foster collaborative networks to share knowledge between countries (so it is not necessary to move people) • Pool resources with countries, regions, and institutions with similar needs (joint programming or joint use) • Improve coordination and management of commercialisation, technology and knowledge transfer to obtain a better value from research <u>Other</u> • Avoid duplication of research areas – (thus avoiding competition?) • Structural funds need to be focused	• Difficulties in defining strategic focus by HEIs and governments • Disjoint between academic and industrial research • Political influence in the management of universities • Lack of experience in applying for EU programmes (eg FP7) and tasks often delegated to inexperienced staff – vicious circle (lack of support for proposal presentation)
What has to be done to develop infrastructure?	<u>Formulate Strategies</u> • Conduct an appropriate analysis and develop a strategy • Build critical mass: open new areas vs. maintenance of existing ones – long term strategy seed funding, access arrangements • Have a clear sustainability plan <u>Assess Human Resources</u> • Conduct an evaluation of human resources for now and the future • Human resources = equipment – running costs and amortization/value <u>Consider Funding Schemes and Cost Management</u> • Give more lump sum to the universities • Find a balance of investment between capital and recurrent costs including HR • Promote the professionalization of HE/research management, including financial management	<u>Combat Funding Issues</u> • Too high expenses, empty rooms, poor location • HE and R&D not considered as investments • Difficulty in finding funding for maintenance expenses <u>Find Solutions to Human Resource Issues</u> • Having the appropriate personnel for the lifecycle management of equipment/infrastructure <u>Other</u> • Artificial separation between HE and research (for administrative purpose and beyond) • Dubious legal status and arrangements for cooperation with other countries

	Appropriately Manage Collaborative Efforts • In cooperative/collaborative efforts, how to decide who takes the initiative • Coordinate between national policy and European policy for infrastructures, for example, energy – logistics • Consolidate European centres of excellence	
What has to be done for governmental / institutional development of strategies?	Consider the Strategy in Conjunction with Other Objectives • Align the strategy with an overarching strategy of socio-economic development • Align institutional strategies with national (international?) strategies without blindly copying them • Realise that there might be a significant difference between a national strategic perspective and an institutional one • Foresight exercises at the national level (research sector in general along with HEIs and industry) to help decision makers Ensure Commitment from All Levels • Ensure there is real political will and commitment to implement decisions taken • Involve researchers to ensure buy in for the strategy • If you make a strategy then implement it! Determine Responsibilities • Decide upon and respect the level of decision making and responsibility • Agree a "champion" or "owner" who takes responsibility for ensuring the strategy is implemented and evaluated • Without duplicating tasks – find a balance between bottom up and top down decision-making • Elaborate a contract between the government and the universities for several years and evaluate this policy • Determine how to control strategy implementation Other • Rationalisation, esp. in small countries • Consider different starting points of the countries • Ensure adequate resources for any longer term strategy implementation	• From the analysis, to where does the strategy lead? If nothing comes of it, what is the next step? • Changing political party/government (lack of consistency or continued commitment) • Institutional autonomy/lack of alignment needed to develop institutional strategy

Discussions on two points in particular were raised towards the end of the workshop:

- Good practice for cooperation with the private sector
- Sustainability

Good practice for cooperation with private sector

Cooperation with industry is increasing and becoming more and more important for the purposes of building research capacity. Joint capacity building with the private sector plays out differently in different countries.

In *Ireland*, industry is working closely with universities and because research capacity has been built up, more international companies are coming to Ireland. There are new opportunities for structured placements for graduates, post graduates and post docs in industrial labs. Graduate schools are being set up with industry which is facilitating mobility and industry representatives are present on the steering committees of the schools.

Denmark is building knowledge transfer relations with industry and has found that setting up business incubators in the university helps facilitate relations. Universities must also defend their interests and establish legal offices to avoid issues with ownership of ideas and patents when researchers have collaborations with industry. Of note is the interesting role of the government to create model agreements, an important State function to support self-steering universities. For example, in collaboration with the universities and experts in IPR (lawyers), the Danish Ministry has worked out a set of model agreements for cooperation with industry to avoid patent disputes.[4] It also has an industrial PhD programme in which a student is hired by a company and attends university, dividing time equally between the business domain and academia. The company is financially compensated and benefits from fresh talent, whereas the university's own expenses are reduced and stronger ties to industry are created.[5]

In *Estonia*, industry is a bit more hesitant to contribute to curriculum development, though universities are interested in developing this. The country has created an IT college as an alternative to established universities to solve practical problems, be more entrepreneurial, be more practice based, and to professionalize higher education. It was created in 2000 with significant private sector support, though they were forced to change the business plan after the economic crisis. Despite less support from industry, the IT College survived and it has created a new culture of teaching, creating competitiveness and modifying university culture as well. The College is now ten years old and considered well established.

Sustainability

Despite some issues with private sector involvement, it is likely part of the answer for sustainability purposes. A programme that does not have continuity or certainty of funding is at risk. Bringing in public money to start a programme (such as the Irish PRTLI programme) and then increasing the private portion to continue it is likely to be a viable solution for the future. Nevertheless, there are tensions related to the time gap between investment and outcomes. As mentioned from the Danish context for the UNIK projects, sustainability is also partly ensured when an institute is also supported by and integrated into the university. For example, when a research institute obtains fruitful results, the project may be integrated long-term into the institution's research portfolio, supported by a special laboratory or centre.

It is not realistic for governments to think that research can be commercially sustainable. It must be viewed as an investment into the economy with indirect benefits in innovation. Sustainability is reached once the eco-system has been created, but it also requires constant retuning with all the parties in place.

We note that the diversification of funding sources is a key element of sustainability as provided by the example of Warwick University with only 30% of income from public funds, described in Clark's book on entrepreneurial universities.[6]

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[4] For more information, see: http://en.fi.dk/innovation/model-agreements/?searchterm=Schlüter

[5] For more information, see: http://en.fi.dk/research/industrial-phd-programme/?searchterm=industrial%20PhD

[6] Clark, B. R. 'Creating Entrepreneurial Universities. Organisational pathways of transformation.' (1998), Pergamon IAU Press.

The question of the place of sustainability in research was also raised and whether or not it is rather part of the management model. The moderator noted that RWTH Aachen in Germany funds a number of high risk research foci with new ideas with the inbuilt mechanism of competition amongst them, i.e. only the top 3 to 4 are meant to be sustainable. In this case, the non-sustainability of certain topics creates the sustainability of the system.

3.2. Challenges to building up research capacity: Brain Circulation

Building up research capacity encounters different challenges in different contexts. However, based on the responses of peer learning countries, it appears that all are experiencing challenges regarding the best way to approach brain gain/brain drain, or brain circulation,[7] and are endeavouring to find the best strategies to deal with how this situation is playing out in their country. Brain circulation policies differ according to the degree of outflow and inflow of researchers, the resources of a country, and its past experiences. Some features of the policies can be identified, such as which actor(s) implement(s) the strategy (a national policy, regional policy or university specific policy), the form of the measure to attract researchers (long-term immigration, limited stay, or a cooperation with another country or university, etc.), the target group (emigrated researchers, foreign researchers, domestic graduates or PhDs, researchers from private sector, returning nationals, national abroad with incentives to/conditionality of return), the degree of openness (field-specific), the details of the measure (information, financial incentives, scholarships, regulations, working conditions, career options, transparent application procedures, etc.), the evaluation or performance assessment (indicators, international evaluation), and the selection criteria (curriculum, project, field).

A brain circulation policy consists of a *special combination* of actors, target groups, degree of openness, etc. For all of these features, there are specific options. For example: A government sets up a programme to attract foreign researchers in a special field of national priority, focus on a limited stay in the country, provide additional funds and select the researchers based on their project. There are many ways to combine the features to create coherent policies.

Country examples and discussion outcomes

Two countries presented their specific cases of brain circulation policies: Lithuania and Poland.

Lithuania launched a programme in 2008 with the goal of bringing Lithuanian researchers living abroad back to the country and to attract foreign researchers. This is hoped to be achieved through direct measures of competition-based funding (researcher career programmes, etc.) and indirect measures of reform of science and studies (creation of 'valleys'[8], national integrated programmes and reorganisation of the network of research institutes). Legal restrictions have

[7] It was noted during the discussion that the term "brain circulation" is perhaps a better description of the phenomena as this assumes an open-door policy whereby researchers are free to leave their country of origin and return when and where the conditions are most favourable. Rather than implying a negative connotation with researchers gaining experience abroad with "brain drain", or implying only an interest in attracting researchers with "brain gain", brain circulation favours both the attraction of researchers to the home country as well as the sending out of researchers for a healthy mobility balance.

[8] A cluster of high-technolgy businesses and research centres, often linked with a university and focused on the knowledge economy.

been lifted to make visa procedures simpler but analysis has shown that Lithuania is still not an attractive destination and remains a transitional station. However, the programme is still in the initial stages and issues of programme coordination and monitoring are currently being dealt with.

Poland has introduced four schemes to attract fresh, young talent to the country: Minister's scholarships for excellent young researchers, "Homing Plus" - a scheme to attract young Polish and foreign PhD holders, "Welcome" - a grant designed to encourage top scholars to build research teams in Poland, and "Focus" - a scheme to fund young PhD holders to pursue priority research areas and build research teams. These schemes have had only modest success so far, since the perception is that once the 5-year period of funding is over, the schemes are no longer sustainable and researchers will find themselves "stuck" in an unattractive research environment. Poland struggles with system-based obstacles (old boys' networks and entrenched interests of senior professors creating obstacles to researcher careers) and it is hoped that the programmes will act as change agents within the system. Much of Polish reform is directed towards breaking these networks down and transparency is recognized as key to overcoming these challenges. At competitively selected leading domestic research centres (KNOWs), there are numerous efforts underway to attract researchers, including topping up of academics' remuneration, higher scholarships, and employment benefits for excellent foreign academics.

Other countries commented on their own strategies and measures for brain circulation:

- *Ireland* described their very successful participation in the Marie Curie COFUND activity. This EU programme provides 40% co-funding to selected regional, national or international mobility fellowship schemes for researchers at post-doctoral level and beyond. Both of the two Irish Research Councils have been successful in applying for this kind of support and now offer career development fellowships with a compulsory (fully funded) reintegration phase in Ireland. The levels of funding are significantly higher than in the standard government-funded scheme.

- *Belgium* noted that the country fosters mobility since Belgian researchers tend to stay within their national system and it is feared that there is too much "in-breeding." The country implements the European Partnership for Research and encourages its PhD candidates to request short or long scientific stays abroad (mobility out) while keeping their salaries/grants and various funding for equipment (bench fees).

- *Malta* has an initiative in the area of graduate and post graduate studies offering grants to Maltese residents for capacity building in science and technology, ICT and education sector. The country also revealed their example of a Maltese professor abroad who welcomes several Maltese PhD students every year for one or two semesters to join his group before returning to their country. The group formed in Malta with links to this professor has created a strong institutional connection and collaborative structure.

- Estonia have two programmes which focus on attracting post-doctoral researchers and top level researchers: Mobilitas (Social Fund) and ERMOS (7FP).

- *France* and the *Czech Republic* noted the influence of regional actors developing strategies and identifying funds to attract researchers to the region.

- In *Denmark*, attracting researchers is part of a national strategy as a marketing campaign. Universities do not give priority to Danish researchers, but rather they are interested in international recruitment, selecting whoever is the best. They recognize their tactic as more assertive than defensive and also that they are already in a position to provide excellent conditions and research environment.

The Danish example raised the point of the importance of considering foreign-based researchers in general rather than concentrating on bringing back nationals currently abroad. A number of countries around the world are producing top quality students and researchers who are particularly interested in having a career in Europe or spending some time in Europe. This opportunity could be more openly recognized. Though some countries may not be able to garner the absolute top level researchers in these cases (who likely prefer to go to English speaking countries or those with the strongest reputations), a consideration of how to attract the strong second level researchers is still worthwhile.

Countries tended to identify increased monies for scholarships and more generous contracts as a main policy strategy to attract researchers. However, the principle of extra funding for extra quality can meet with resistance within the academic community. Nevertheless, it was also felt that if a premium is placed on quality, it requires a new way of thinking. In the long term, such a policy can lead to the creation of flagship universities, creating stratification within the country and comparable elites across countries.

The challenge of providing adequate social insurances was considered to be an issue that had relevance for the EU.

3.3. Approaches to Organizing Growth

A second aspect of research capacity is the way in which the capacity growth is organized and the challenges tackled. For capacity building to be successful, it must be organized and planned for optimal results. The country cases focused on three examples in which this may be achieved.

Country examples and discussion outcomes

Denmark approaches capacity building with planned investments and infrastructure in the context of both a national and an institutional strategy. The organisation of physical growth is managed in a combined decision-making structure - where the agency is responsible for best practice in the professional management of invested capital, benchmarking and overall development of physical infrastructure of R&D. It operates on a market-based model since universities can choose to go to the private market rather than to the government agency and can leave the property with six months' notice. The universities on the other hand have the autonomy and means to decide on property requirements. They have the strategic closeness and best insight to their own needs. The model endeavours to benefit from both a decentralised strategic capability (from the institutional perspective) and a centralised competence and overall responsibility (from the national perspective). The Ministry tries to be a partner in the process and to inspire each university to do their best. Dialogue and co-operation are fundamental as is transparency over decision-making and funding mechanisms.

The Czech Republic focuses on building centres of excellence and fostering an innovation strategy called the Operational Programme Research and Development for Innovation (OPRDI). It is examining the dilemma of how to distribute €1.6 billion in ERDF funding to address fragmented and underdeveloped research as well as low engagement with industry not interested in collaborating with academia and low engagement with international partners. The main measure of OPRDI is support for Research Centres, including "hard" investments (especially in new technologies) and start-up grants. Choices have to be made whether to support research units that performed well in the past or those with future ambition, and what selection criteria should be applied. Other issues raised include the long-term sustainability of the projects, the professional management of the funding and activities, and the selection procedure.

France concentrates on the institutional development of infrastructure, human resources in the context of national policies and local research priorities. National measures that have been introduced to keep and attract researchers include improving the conditions of excellent research teams and providing additional funding for excellence. There are also measures to improve the infrastructure known as "Plan Campus" which provides significant funding to renovate and create new buildings, host firms created by PhD graduates, attract top talent and fund selected projects. Ten campuses have been selected including Le Havre University which has received funding to set up an international house of research to host international researchers working with local researchers. There has since been a second round of funding in the form of a national loan to set up higher education and research clusters. New tools have been created to evaluate and define scientific strategy and encourage greater collaboration with industry. The new policy focuses on activities at the international, national and regional levels, encouraging stronger collaboration of stakeholders and greater complementarity of tools. Regional relations are particularly important in France. Defining a "geo-strategic" approach (thinking globally, acting locally) is meant to be more attractive to researchers.

During discussions, the importance of financing all thematics of research was emphasized. When there is greater collaboration with industry and applied science contracts are won, the additional monies can also help to finance social science labs, for example. In addition, as it is difficult to anticipate which research areas will be important for the future, all need to be funded as best as possible. At the same time, focusing on certain research fields has been successful for a number of countries: In *Malta*, finding a research niche not covered by others has been important for the economy, whereas in *France*, a focus has brought a certain visibility to many universities. Maintaining a balance between focusing on certain research fields and covering a wide spread of fields is a dilemma faced by several countries.

Another discussion point worthy of country comparison included different models for investing in large research facilities. The market model in *Denmark* with high university autonomy provided an interesting example. Rather than asking for applications, distributing the money to universities and letting them decide how to use it is a possible alternative.

3.4. Special Interventions

In the final round of country presentations, specific interventions were examined. These were meant as high-impact and targeted initiatives which focus on a distinct outcome, as opposed to the organisation of growth which implies system intervention. Examples from Malta and Ireland were presented.

Country examples and discussion outcomes

Malta has promoted targeted capacity building to "fill in the gaps" the country is likely to face in the coming years. "Skills for the Future" identifies supply and demand of skills through research, stakeholder conferences, reports, international collaboration, and ESF projects (to tackle the issue on a long term basis and to do a proper skills analysis.) In order to do capacity building, it was necessary for Malta to know which areas were important to focus on. Part of the analysis uncovered the need to enhance university-business cooperation. Thematic forums were created on the basis of four pillars: strategy and direction, HR competence building (to train graduates, etc.), public awareness and stakeholder engagement, investment promotion targeted at FDIs and start ups. Industry strengths were identified and then research capacity was built up at the university to support it. Researchers are encouraged to focus on areas of strategic interest. Support is provided by the government but the main actors are the university and industry. The main outcomes have been enhanced co-operation with industry, identification of niche sectors (digital games production, aviation, maritime, etc.) and development in tune with country requirements. As a small country with one university, Malta is under pressure to employ a very applied approach whereby it covers all areas of research while asking researchers to focus on certain niches in order to also produce quality.

Ireland presented their experience with PRTLI (Programme for Research in Third Level Institutions) funding since 1999 and how this has generated five cycles of development, each with a specific focus that has improved research capacity and encouraged a culture of collaboration. Ireland has improved its physical and support infrastructure which has led to significant change in the sector. It has enhanced the sector reputation, increased non-Exchequer investment, publication and academic talent, IP output, industry development and direct and indirect private sector involvement. From the institutional perspective, PRTLI has been transformative for those who received monies. It brought forward the cultural mindset in the institutional context that research is an important focus. The programme has also been key in bringing the weaker institutes into a much stronger position. PRTLI is co-funded by the European Regional Development Fund. However, it was also stressed that ERDF is heavily regulated and audited and strict adherence to EU funding regulations is essential, otherwise the recoupment of ERDF funding, used to build capacity, carry out capital investment and refurbishments, may be put at risk. In particular, attention should be paid to procedures, publicity and information requirements, procurement records and documentation retention.

The discussion began on the process of strategy development. It was noted that attention should be paid to the interaction between top down and bottom up elements. The issue of where a country is in its stage of capacity building largely determines its national strategy, though it is important to recognize that this stage is continually evolving and that it is often involved in a cycle of renewal rather than building from scratch. Re-thinking institutional strategies is crucial to creating a dynamic system.

Change is often born out of a need. Before PRTLI, there were no support mechanisms in place for preparing grant applications. Universities now have Research Support Offices to support those applying for research.

It was recognized that the process of selecting a research area is a difficult one. Different opinions arose on funding research areas. Establishing a small seed fund might encourage research in a particular area. As a non-confrontational way for universities to arrive at research priorities, they may give researchers the choice to get in line with a university's strategy or to burrow their own line, but without receiving seed money. Regardless, it is necessary to fund all sectors so as not to stifle what future areas of research will be. There can be a focus, but it is also important to let people research their own interests. The dynamics in the economy also determines an institution's strategy in this respect: the more unstable an economy is, the more flexible you have to be and the more you need a broad base in research. When a small country is just catching up, you may have to be a bit more daring rather than just look at the well-established countries and follow the beaten path.

PowerPoint Presentations
All presentations are available on http://www.ubst.dk/en/international-cooperation/eu-crest-peer-learning-activities-on-universities

3.5. Lessons Learnt on Building Research Capacity

General Issues of Capacity Building

There is a **path for institutions to take regarding capacity building**: from initial development to organizing growth to maintaining sustainability. Throughout this path, both **human capital investment** (including early career researchers) and **infrastructure enhancement** are vital elements. Although there is **no golden rule in the balance of** human capital investment and infrastructure, you have to start somehow and then monitor the effects and react (leaving autonomy to the institutions while allowing for some top-down developments). Furthermore, for capacity building measures to be successful, **long term strategies** are needed which create **coherence between different instruments**. Since instruments are often created independently, contradictory incentives should be avoided. **Securing long term funds** and **coordinating at the regional and international levels** are additionally important to ensure the sustainability of research capacity. It was noted that **a shift in paradigm is needed** to improve management and encourage governments to consider HE and R&D as long-term investments. To foster professional practices, **foreign experts are needed** for judging capacity building, even in large countries. Furthermore, **the role of the EU** is particularly important in the building up of research capacity. The challenge of **providing adequate social insurances** is considered to be an issue that has relevance for the EU and the **harmonisation of systems** to facilitate researcher mobility is encouraged. Recommendations and lessons learnt based on country experiences for three specific topics of capacity building are presented in the following pages: Brain Circulation, Organizing Growth, Targeted Interventions.

In all sections, main recommendations are presented first followed by further recommendations or pertinent observations.

A.	*BRAIN CIRCULATION*

Recommendations and observations can be made for brain circulation policies across Europe. The main recommendations can be grouped into three general areas:

- Specific brain circulation approaches
- Human resource aspects and the research environment
- Ensuring balance

Main recommendations

1. **Instead of only discussing brain drain and gain, encourage "brain circulation" approaches** which are more positive and assertive and which include sending out researchers in structured and non-structured ways. Sending researchers abroad should be a systematic element of brain circulation because it encourages international cooperation.

2. **Clusters of measures can be taken to promote brain circulation** despite the brain circulation situation being very different across countries, with some places being more attractive and competitive than others. Nonetheless, these measures can be applied to most circumstances. If a country is advanced in one area, efforts can be concentrated elsewhere. These measure include:
   - **a.** Create **targeted funding programmes with links between target groups** (form consistent with the needs). Schemes to attract researchers from abroad can differ, but should be applied according to targets and target groups.[9]
   - **b.** **Promote career perspectives and career transparency**
   - **c.** Consider the general **research climate and autonomy in research**
   - **d.** Consider the **general framework conditions** (visa facility, employment, social insurance legislation, etc.)
   - **e.** **Foster improvements to research infrastructure** (linked with attractiveness)

3. **As the quality of Ph.D. training is a key factor to avoid brain drain, a SWOT analysis of European Ph.D. programmes is needed** (to avoid US „skimming" of Ph.D. candidates trained in European countries with taxpayers' money). Pure „in-bred" Ph.D. programmes should be stopped. Eastern European countries have a special chance through the opening up to Ph.D. candidates from former Soviet Union countries. European projects with cooperation of HEIs from old and new MS and non-EU-countries should be promoted.

4. **Improve conditions for researcher mobility:**
   - **a.** Consult the target about impediments and get serious about removing bureaucratic barriers such as limitations on research stays, visas, etc.
   - **b.** Consider national mobility schemes which are open for everyone, not only for residents/specific nationalities (especially the incoming direction).
   - **c.** Implement a more coordinated effort across Europe to ensure pension plans are continued or social insurance is quickly ensured.
   - **d.** As a concrete measure, better use of the Marie Curie COFUND for post-doc mobility to support more researchers in gaining international experiences.
   - **e.** Create opportunities to network with nationals abroad in order to leverage brain drain and turn it as an advantage.

5. **In all policy approaches, there should be a healthy balance of measures and these measures should be complementary.** It is important to also coordinate balanced measures at the institutional/individual level, for regions and institutions, and for research excellence/needs of the economy. A mixture of different programmes for different target groups should exist. There should be no contradictions between the programmes, for instance, in terms of financial incentives. Furthermore, it is not only important to attract the researchers but also to place them into the adequate institutional or regional environment. Individual brain gain funding should not contradict institutional promotion (like 'valleys', research centres, etc.), but should also give a chance to talents outside the priority institutions. Fields might be needed for the economy even without top research

[9] Examples include: junior/senior, long-term/short-term, open/discipline-focused, offer scholarships/research funds, foreigners/emigrated nationals, etc.

and sometimes new excellence emerges in unforeseen areas, coming from individual initiatives.

Further recommendations / observations

6. A major role of the institution lies in the establishment of cooperative structures supporting brain gain. In order for this role to be fulfilled, the state could contribute to the 5 clusters mentioned in recommendation #2. Parallel to this, the institution has to support the brain circulation approach by cooperation and should make State frameworks a reality (research climate, support mechanisms for researchers, freedom in research, etc.)

7. If you start from an attractive position in terms of recruiting researchers, the best (and simple) brain gain strategy is "we take the best we can get in the world and do everything we can afford to get them", such as in the Danish example. However, due to worldwide competition, this position must be already highly attractive.

8. Professionalization of governance and management with performance orientation instead of old-boys networks, etc., helps for brain gain, but the beneficial effects go further. General reforms in the governance, decision-making and management of universities are complementary to specific brain gain measures.

9. Overcome paradox caused by international rankings: Investment in research is favoured by the existing rankings, but teaching quality is neglected and therefore, the HR basis for capacity building is endangered. Staff should focus on strengths in teaching vs. research and assessments should include the teaching function. The development of HR for research is a matter of lifelong learning and this should be addressed accordingly.

B. ORGANIZING GROWTH

Recommendations and observations can be made for organizing Europe's growth in research capacity. The main recommendations deal primarily with investment/funding issues and setting research priorities.

Main recommendations

1. **For investment decisions, choices have to be made concerning the level (whether for a region, a cluster, a specific campus, etc.) and an adequate top down – bottom up approach is needed.** Decentralized institutional autonomy is advised, but some rational coordination of the decentralized plans is needed and there are also possibilities to induce developments top-down. These recommendations are not only valid for the government-institution relation, but also for inside institutions.

2. **For infrastructure, top down/bottom up means abandoning traditional lobbying procedures and creating rational structures.** There are different ways to approach the distribution of finances rather than through lobbying. For example, contracts allow for more transparency and there is a criterion for evaluation. **Additional alternatives include the market model (Denmark example) and specific top-down interventions such as lab**

programmes (the Czech Republic, Denmark and the French Campus of Excellence examples). Regarding targeted interventions, these can be made through targeted programmes, through target agreements, or through market mechanisms. In general, for all approaches, there should be efforts to enhance decentralized autonomy.

3. **To focus investments in research capacity, it is advised to combine different aspects in a strategy** (disciplinary strengths, markets, niches, etc.) **and combine internal and external factors** (SWOT approach). Focus enables visibility and is particularly important for small universities. Decisions have to be made in co-ordination with the different aspects of investments. In Denmark, this happens at the institutional level with a lump-sum budget enabling the universities to choose how to invest. **Strategic planning is necessary to ensure a balance in investment in different areas.** There should be no fixed ratios, but rather, flexible adjustments in investments. A careful selection of proper indicators is advised for the monitoring phase. Lastly, looking forward instead of analyzing past deficiencies helps to remain positive and focused on outcomes.

4. **EU Structural Funds are an extremely important basis for development, but there are specific issues when dealing with structural funds which need to be addressed.** Though the funds contribute to many of the investment programmes across Europe and provide support for modernising economic structures and investing in equipment, there is no aid for maintenance or infrastructure funds, requiring the national governments to find long-term funding. There is also the question of whether structural funds should support European competitiveness or underdeveloped regions, whether they should become more focused and strengthen existing strengths or adopt a broader spread to overcome systemic problems. Whichever approach is chosen, **the Commission could work on greater harmonisation between programmes, adopting more similar rules between programmes, avoiding line item budgeting, and offering more flexibility on deliverables.** At the same time, national governments should also adopt similar criteria and not be stricter with deadlines and documentation than rules from Brussels. Transparency, regulation and coordination between different sources are required to ensure there is more flexibility when monies are coming together from different sources. In this way, **each party can contribute to making the programme more successful.**

5. **Focus on priorities:**
   - **a.** When setting **priorities in growth strategies**, it is also important to allocate funds to thematic areas that are less able to attract private funding.
   - **b.** Deciding on **research priorities**, choosing the criteria, and selecting appropriate experts to make the decisions and monitor the outcomes must be done carefully and transparently.
   - **c.** **Institutional priorities** need to be visible.
   - **d.** **Regional priorities** need to consider how they can be supported by **national or international priorities.**

Further recommendations / observations

6. For the evaluation of investment, two perspectives should be taken into account: utilization and output. Questions to ask include:
   - Is the infrastructure really used and which outputs are produced with it?

- Is it too late to invest in a specific infrastructure since it has it already been built?
- What learning effect remains?
- Are there ways of intermediate evaluation?

7. In a situation of fast growth, you can't be too focused on investment, but you can concentrate on basic values in research (quality, support for human resources, cooperation, entrepreneurship etc.). A broad definition of focus with no narrow field priorities is advisable. Governments should be aware that R&D can also be a driving force for economic change.

8. Capacity building should be linked with clear policies on property rights. Clear individual/institutional roles should be maintained whereby the individual incentive is kept, but the institutional role is ensured.

9. For small countries, a capacity development in consortia is an attractive and feasible option. A prerequisite to this is the mapping of capacities in a region in order to avoid unnecessary duplication (keeping in mind competition!)

10. Social funds provide support for training PhD candidates but are very strict on deliverables and this inflexibility creates problems.

C. SPECIAL INTERVENTIONS

Special interventions were presented by some countries and specific recommendations or observations are highlighted below. The main recommendations focus on strategy development and investment/funding priorities.

Main recommendations

1. **Strategies have to identify the right priorities, but also have to create acceptance and ownership.** Many good practices could be found how to balance top down and bottom up in strategy development.

2. **Special attention to the *process* of strategy development for capacity building was noted as essential for success and researchers have a crucial role in defining the strategy**. In other words, it is crucial to determine which groups have to be brought together and what are the steps to build the strategy (highlighted in the **Maltese example**). Elements of strategy development include research/foresight, stakeholder meetings, creating awareness, etc. In order to build capacity, it is necessary to know on which areas it is important to focus. **Stakeholder forums in particular are a good way of carving out research niches.**

3. **Investment strategies have to be made without political influence.** Plans have to be based on rational assessment methods (with transparent indicators of success: research performance, regional impact, etc.). An analysis of real needs and an assessment of opportunity costs are needed to be sure to make the right investment. Finally, be sure to use the advice of stakeholders for setting priorities.

4. **The orientation of funding to promote capacity building has to change over time** since funding cycles and priorities change. The research landscape also changes and new investors enter. One of the greatest challenges at the institutional level is of making strategic choices and not stifling research. Country examples show realistic paths and can be referred to for reference. A **good example would be that of Ireland** (10 years with 5 cycles: institutional strategy/physical infrastructure – collaboration incentives – centres, specialized infrastructure – national strategy/networks – concentration, consolidation, coherence). In general, it is a learning process for those involved and an accumulation rather than a sequence of policies (in the Irish case, institutional strategy became part of the normal business and was not stopped in the 2nd cycle). Policy makers and leaders should recognize that it can be a difficult process but once achieved, people will fall in line with the declared direction.

5. **If targeted investments in priority areas are made, the broad base of research should not be forgotten.** As new needs emerge outside priority areas, it is imperative to preserve the starting point to be successful at that level. Again, an appropriate balance needs to be found.

Further recommendations / observations

6. When organizing capacity growth, attention should be paid to the stage of development of the national system – whether a country is catching up, seeking to maintain the status quo, or renewing/building from scratch and that this stage is continually evolving. Thus, policymakers should remain open to re-thinking institutional strategies. In all cases, support mechanisms should be in place to help researchers in filling out research funding applications. It is importance for capacity building to have the appropriate tools to apply for funds, for institutions to provide support offices, vice-presidents/deans for research, etc.

7. If private sector involvement is a part of the sustainability of research measures, there should be measures to ensure ideas stay with the universities. There may be issues of conflict when funding comes from enterprises interested in research but which are not interested in teaching and learning. Business offices and others can promote university and industry cooperation while also providing assistance to researchers on technical matters. On a higher level, governments should develop model agreements and contracting tools to prevent patenting issues.

4. Evaluation of PLA methods

This third PLA marked the crossing over of the halfway point in evaluating the method used for these CREST activities. A number of improvements were made to the design of the workshop and to the interactive activities. In general, participants were very satisfied with the usefulness of peer learning in this context, with over three-fourth of respondents rating it highly. This demonstrates that the method of peer learning was considered appropriate and worthwhile for the context of the topic, capacity building, in order to share and receive information from colleagues. The Gallery Walk in particular was considered very valuable and was also probably appreciated even more so than in previous PLAs due to the addition of the Gallery Walk Revisit at the end of the second day of the workshop. This provided an opportunity for further discussion on topics which may have been overlooked in the first day's discussion, namely issues of the private sector and sustainability. The card collection activity was also improved upon, with outcomes collected at the end of the first day in order to refresh memories for the start of the second day and to provide a link to the discussions. This method proved effective and will likely be adopted for the remaining PLAs.

The workshop length had been shortened from two days to 1.5 days, but participants commented that this felt too short and presentations were pressured to end on time rather than continue discussions.

Some concern was expressed regarding the lack of active participation on the part of some participants. Although some participants felt that there were colleagues who were not sufficiently active, the majority felt the composition of the peer group generated a good level of exchange of ideas and discussions. Based on the evaluations, all participants indicated that they were more than satisfied with the opportunities they had to participate in the discussions and bring interests and concerns into the agenda.

Overall, it was recognized that the event was very well organised and most informative and that the different activities (presentations, discussions, gallery walk) were all appreciated as was the social atmosphere that encouraged networking. One participant felt that the PLA could have lasted 3 full days.

5. Conclusions and perspectives

The third PLA on research capacity building revealed a mixed picture of country priorities, strategies and policies aimed at promoting brain circulation, organizing growth and establishing or continuing targeted interventions. Country case studies showed that most efforts are geared towards brain gain and avoiding brain drain, though examples from some countries encouraged a more flexible and assertive approach with brain circulation measures. With regard to organizing growth, this most commonly concerns the building up of infrastructure, though efforts in human skill enhancement are also present. Lastly, special interventions provided a glimpse of a couple of successful, high-impact initiatives which are worthy of consideration for other contexts, provided the appropriate modifications were made for the cultural setting.

Discussions raised various issues concerned with sustaining research capacity, involvement of the private sector, the roles of stakeholders, the process of strategy development and setting research priorities as well as when and why to focus on specific areas of research. Decisions concerning these topics are largely driven by country context, including funding levels and mechanisms, at what stage they are currently in their research capacity agenda, the general research environment and conditions for researchers, and the reputation of the country for providing quality research opportunities.

Though many initiatives and programmes are in their initial stages or are undergoing pressure from funding cuts and the economic crisis, creative solutions are also being found, often where universities have been given the autonomy to make decisions on their own research capacities. The ever increasing role of the private sector in building research capacity is evident, though the question of its exact role remains open and a number of models remain possible. How to integrate other forms of investment, as well as the best mix of bottom up and top down approaches will likely add to the debate in the coming years.

Summary Report of Peer Learning Activity 4

Early Career Researchers: Recruitment and Careers

Dublin, June 2010

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1. Introduction

1.1 Context and challenges

Global shifts

The growing need for qualified researchers to drive the global knowledge economy remains a key point on the agendas of political and scientific communities worldwide. For a strong and dynamic economy, good science and healthy doses of innovation are needed to develop new products and promote competitiveness. Universities are key players in this endeavour. Strategies to attract the best researchers, to keep them and to create favourable research conditions for them are becoming more and more important. Financial and legal provisions can play a crucial role for ensuring a good research environment and a high level of satisfaction both for the researchers and the institutions employing them.

The United States and Britain attract many of the most talented PhD candidates and researchers from around the globe due to rather flexible systems and greater rewards for innovation and creativity, leading to a worldwide net flow of research talent from East to West. At the same time, as large emerging economies such as China and India begin to make their presence felt, both economically and regarding the quality of their Higher Education and research systems, potential PhD candidates and future researchers from these countries are considering staying at home rather than going abroad. Offering a high quality research environment and top conditions is thus imperative for all countries in order to attract, develop and maintain a stable and innovative researcher base. At the same time, international mobility should be encouraged in order for researchers to gain enriching experiences in other contexts and to build networks with scientists in other countries, which can in turn lead to international collaborations between research groups and links to other resources.

European context

Over the last decade, the number of PhD candidates and graduates in Europe has increased significantly. While this is clearly a positive trend with a view to fulfilling the needs of a knowledge economy, it also constitutes a challenge to the European Research Area. A broader research ecosystem is needed to accommodate these new researchers and to allow them to develop their careers so that they can fully contribute to the development of ERA. In some countries, PhD graduates are experiencing difficulties in finding employment. In the academic world, PhD candidates and recent graduates often face precarious conditions and temporary contracts, and their research environments are not always very satisfactory. In times of growing globalisation, it is increasingly important that graduates obtain experiences through research stays abroad, but the obstacles to mobility (both short and longer term) are still numerous.

Although there are many challenges facing universities, taking care of their researchers is a top concern and many countries are introducing reforms to provide better support, to make the research career more attractive for potential candidates, and to attract researchers from within their countries as well as from abroad.

In 2000, a high level group was established to identify obstacles to the mobility of researchers and in 2001, the Commission proposed to set up a Researcher Mobility Portal and a network of Mobility Centres.[10] What is now known as the EURAXESS Portal - *Researchers in Motion* was conceived in 2002 (and the ERA-MORE network of Mobility Centres in 2004). The Commission

[10] Mobility Strategy from 2001

created these information services to provide essential support for scientists and their families. Job postings, a network of service centres, a description of rights and obligations, and a site for useful links for European researchers abroad are included in the EURAXESS Portal.

At about the same time, during the Barcelona European Council in March 2002, the objective was set to raise overall R&D investment to 3% of GDP by 2010. In September 2002[11], the Commission published a Communication on '*More Research for Europe: Towards 3% GDP*' and in April 2003,[12] a further Communication on '*Investing in Research*' set specific targets in terms of the human resources necessary:

"*Increased investment in research will (must) raise the demand for researchers: about 1.2 million additional research personnel, including 700 000 additional researchers are deemed necessary to attain the objective – on top of the expected replacement of the ageing workforce in research."*

This led to a shift of focus from research as such to the researchers that are performing this work. Addressing issues related to researcher careers, the Council Resolution of 10 November 2003[13] on the profession and the career of researchers within the European Research Area welcomed "the Commission's intentions to work towards the development of a "European Researcher's Charter" in order to further improve the framework for the career management of human resources in R&D, and a code of conduct for the recruitment of researchers, taking into account the specificities of different sectors and based on best practice" as announced in the Commission Communication "Researchers in ERA: one profession, multiple careers".[14] The "Charter and Code"[15] ensued in 2005, following a broad stakeholder consultation process.

The 2007 ERA Green Paper, "The European Research Area: New Perspectives",[16] analyses the situation of European research with respect to the six main dimensions of the European Research Area, one of them being the realization of a single labour market for researchers. In the context of the Ljubljana Process for the governance of ERA which was launched in May 2008, the Commission tabled proposals for five new initiatives for the implementation of ERA policy on concrete topics – researchers, knowledge transfer, joint programming, research infrastructures and international cooperation – in addition to continuous work to strengthen research institutions within the knowledge triangle. The first of these is the "European Partnership for Researchers" (EPR).

The purpose of the EPR is to foster growth in human resources for the European knowledge society, thus working towards the objectives of the Lisbon Strategy. It aims at preventing European brain drain and constitutes a common framework and timeframe for MS in joint priority action areas in research and development, such as opening recruitment beyond national borders, improving the portability of grants, ensuring pension and social security benefits including the establishment of pan-European pension schemes, providing opportunities for skills development

[11] COM(2002) 499 11.09.2002
[12] COM(2003) 226 30.04.2003
[13] See: http://old.certh.gr/libfiles/PDF/MOBIL-5-resolution_career.pdf
[14] COM (2003) 436 of 18 July 2003
[15] See: "The European Charter for Researchers / The Code of Conduct for the Recruitment of Researchers," European Commission, Brussels. 2005. http://ec.europa.eu/eracareers/pdf/am509774CEE_EN_E4.pdf
[16] Green Paper of 4 April 2007 on "The European Research Area: New Perspectives." http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=COMfinal&an_doc=2007&nu_doc=161

and training, making contractual and administrative arrangements more flexible, as well as fostering overall improved research conditions.[17]

More recently, the Innovation Union is one of seven flagship initiatives of the Europe 2020 Strategy and aimed to improve financial conditions and access for research and innovation. This initiative highlights that in order to meet the R&D target of 3%, at least 1 million new research jobs will be needed and a significantly greater number of researchers to account for gaps due to retirement in the next decade (p.9).[18] To move towards this goal, measures are needed to make scientific careers more attractive, to promote women in scientific research, to improve and broaden research training, and to promote in-coming mobility through more flexible legal arrangements and increased social benefits.

Despite some improvement it is widely recognized that much further work in these areas is still needed. The issues at stake are of a complex nature, and whether they can be tackled often depends on the funding available and the willingness of institutions to provide benefits while taking the risk that the investments in their researchers may be "lost" if and when the researcher leaves.

1.2. Focus

Promoting the careers of early career researchers and creating favourable research conditions for them presents a challenging yet necessary effort. Universities are not only research performing institutions but are also responsible for educating the next generation of researchers and providing an optimal environment for them. This human factor brings with it a myriad of complex issues as the needs of researchers range from having a motivating research environment, access to top research equipment, access to networks of researchers within and outside of their institution, to social security measures, family-based support, competitive salaries, etc.

Researchers are crucial in achieving an optimal dynamic of the education-research-innovation triangle. Globalisation is offering scientists around the world the choice of where to conduct their research and thereby contribute to the society of which they are a part. As a result, countries are pressured to provide attractive conditions. Though many European and non-European researchers are attracted to the ERA, a number of barriers as well as a lack of flexibility and harmonisation across Europe are creating impediments to an efficient and dynamic flow of researchers. For science to play a prominent role in society, innovation and creativity are needed, but Europe's higher education and research institutions and its funding agencies are often structures of a rigid and hierarchical nature. As the continent confronts an aging population and an urgent need to tap into the enthusiasm and innovativeness of early career researchers, investment in these individuals must be made quickly and specific actions to remove barriers and create attractive opportunities must follow. As part of these actions, awareness of what is happening across Europe to improve researcher conditions should be raised and good practices unveiled. This PLA endeavoured to take a step in this direction, bringing together participants from 10 different countries for mutual exchange and learning.

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[17] See: Communication from the Commission to the Council and the European Parliament of 23 May 2008 "Better careers and more mobility: a European partnership for researchers." http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52008DC0317:EN:NOT

[18] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Europe 2020 Flagship Initiative, Innovation Union. Brussels, 2010. See: http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf#view=fit&pagemode=none

The two and a half day event centred on three main themes which were regarded as crucial for the promotion of early career researchers on the way to research excellence. It included an Irish keynote on each theme and presentations from other European delegates on national and/or institutional initiatives. There was also a very significant emphasis on encouraging participant interaction to ensure the necessary discussion and exchange of ideas would take place.

The themes were:

1. Enhanced researchers' skills and career development
2. Status and employment conditions of early career researchers
3. Transparent research career development

2. PLA structure – Working method – Participating countries

Structure

This 4th Peer Learning Activity was held over 2.5 days, which allowed for longer times and additional activities than the previous 2 day and 1.5 day workshop formats. The lengthened time from the previous 2-day workshop model was decided upon to experiment with different workshop lengths in order to see which might be the most conducive for meaningful networking and exchanges during the peer learning activity sessions.

The welcome address opened the morning session of the first day, with the Higher Education Authority of Ireland (HEA) presented as having the role of both primary funders of Higher Education in Ireland (core and capital funding) and advisors in policy and implementation. Dr. Eucharia Meehan, Head of Research Programmes and Capital Programmes at the HEA, reported on the development of the Irish higher education and research system over the last 12 years, highlighting the role of the two Irish Research Councils (IRCSET and IRCHSS). Associated with a major increase in research activity was an increase in the number of PhD candidates and graduates as well as other early career researchers. These now represent a challenge to the system, requiring a broader research ecosystem to develop that is capable of accommodating them and allowing them to develop their careers. She highlighted that these are challenging times for the employment of PhD graduates and stressed the importance for the development of ERA of gaining strength and learning through the exchange of experience.

The morning session continued with an introduction to the PLA event and a reflection by the European Commission speaker on the new possibilities for realising the ERA since the Lisbon Treaty provides new possibilities, including also legislative measures, to drive the process forward. Despite significant budget cuts in many Member States across Europe, Research and Development have often seen less severe reductions, which could be interpreted as a sign of commitment across countries. It was also highlighted that Universities are not only research performing institutions but also educators of the next research generation, which is the focus of this PLA.

A description of the PLA method and focus followed, presented by the lead country, Denmark.

The keynote speech was delivered by Dr. Conor O'Carroll, Director (Research), Irish Universities Association (IUA), with an introduction of the main roles of the IUA and a description of the

European Partnership for Researchers.[19] He focused on the history of the Partnership, development and outcomes, describing it as a fascinating process from funding to policy, from aspiration to realisation. The question remains open as to whether MS will commit to the Partnership beyond the current timeframe (end of 2010) and agree to concrete measures to implement it, for example by linking it to the Framework Programme. The issue is that MS may agree with the abstract ideas underlying the Partnership but may not want to sign up to the commitment. To be effective, the different elements of the Partnership need to be integrated throughout the whole Framework Programme.

The Partnership encapsulates four elements on which Dr. O'Carroll commented:

- *Open recruitment and portability of grants*
  Open recruitment can be difficult to put into practice due to legal and linguistic barriers. There are also challenges regarding the portability of grants since institutions have to invest money (for example on laboratory equipment or other infrastructure) that might be lost when the researcher decides to leave. When there is full economic costing and all project costs are covered, these issues might be alleviated to some extent.

- *Social security and pensions*
  This is a highly complex area that requires a lot of expertise. There are problems of portability (especially with regard to supplementary pensions), both between countries and between private and public sectors within national systems. A pan-European Pension Fund may be a future possibility where researchers could opt into such a scheme.

- *Attractive employment conditions for researchers*
  The concept of a "research career" and of research as a "profession" is relatively new. Researchers are still very often paid through stipends rather than salaries, especially at the early stages of their career. Even where they are employees, they are often seen as a transient population and not really part of human resources. The 2003 EU Council Directive on the equal treatment of employees on fixed-term contracts and permanent contracts triggered big changes and had varied impacts across countries, not always in the way intended.

- *Enhancing skills and training of researchers*
  This refers both to research training as such and to continuous professional development. Training and skills enhancement programmes for researchers tend to be implemented only at the national levels. An EU-wide framework to implement specific skills development in a coherent and consistent manner across Europe does not currently exist. However, on the EU-level, as part of the Seventh Framework Programme, there is a 'People' Specific Programme which regroups the popular 'Marie-Curie Actions' and is dedicated to human resources in research. Its purpose is to entail "special measures to encourage young researchers and support early stages of scientific career, as well as measures to reduce the 'brain drain', such as reintegration grants (...)."[20]

[19] Communication from the Commission to the Council and the European Parliament of 23 May 2008 "Better careers and more mobility: a European partnership for researchers" [COM(2008) 317]. Brussels, 2008.
[20] See, European Commission – CORDIS, Seventh Framework Programme: 'People' http://cordis.europa.eu/fp7/people/home_en.html

In the interactive Gallery Walk participants reflected upon the question of who should do what to enable early career researchers to develop their careers in research and innovation in the best possible way. Participants also identified what should be avoided by the different stakeholders.

The afternoon session further explored the Irish context with keynote presentations on the three themes which were the focus of the PLA. The Irish structured PhD was described as an example of how to enhance researchers' skills and development. In the first presentation, Dr. Honor Fagan, Dean of Graduate Studies at NUI Maynooth, described Irish developments since 2003, how they accord with national policy objectives and how they reflect the European context in which they are developed. It was followed by a presentation on the role of PhDs in the Irish 'smart economy' by Prof. Anita Maguire from the Advisory Science Council. The final Keynote presentation by Mr. Martin Hynes from IRCSET focused on the Enterprise Partnership Scheme that the Research Council has been running very successfully for a number of years now. Between them, the three presentations covered the three main themes of the PLA.

The first group of country cases were presented focusing on the PhD model and **how to enhance researchers' skills and development**. An interactive plenary panel on good practices followed to pinpoint recommended actions. The first day's session ended with a short summary and the Card Collection activity whereby participants filled out 2-3 cards, answering the following questions according to their own experiences:

- What are the most important problems regarding the status of early career researchers?
- What conditions make research careers for early career researchers most attractive?

The second day opened with an introductory keynote presentation on the **status and employment conditions of early career researchers**. The review of the outcomes of the Card Collection activity followed with an examination of what participants considered to be the most important problems regarding early career researcher status and the conditions necessary to make research careers attractive. The next country presentations on the status and employment conditions of early career researchers ensued and comparative conclusions were drawn. The Irish Universities Survey was presented, offering insights into the researcher experience. A second presentation followed on how researchers can better inform policy and employment conditions as described by the Irish Research Staff Association. The day ended with a short summary and a revisit of the Card Collection outcomes to add further input and good practices uncovered from the day's events.

The third and final day centred on the theme **of transparent research career development** with the final round of country cases presented. In a last interactive session the group was divided into two separate teams. With the European Charter and Code as reference, the participants developed their own "Dublin PLA Charter", which consisted of an exercise to help unveil the optimal skills development and training of PhDs and the best practices in recruitment, status, conditions, and career development of early career researchers.

The event summary closed the PLA session, allowing for further ideas to be developed and a discussion of remaining open questions, including additional outcomes and contributions made on the first and second days.

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. This mutual learning approach was chosen in the context of the application of the Open Method of Coordination to research policy. It was the working method for all five CREST PLA events examining different ways in which national reforms and institutional policies can improve university research performance. The specific issues to be treated by the different PLAs were 'mergers and reforms of the institutional structure of national research systems', 'world-class excellence in university research', 'capacity building', 'recruitment and careers of early-career researchers', and 'new funding models - the costing of research activities'. The Dublin PLA in Ireland was the fourth event.

Based on the previous experiences of the first three PLAs in Copenhagen, Lisbon and Tartu, the interactive tools and the structure of the country presentations were improved upon in order to best ensure efficient information exchange and worthwhile mutual learning. The earlier scheduled Gallery Walk was kept as a warm-up activity in order to create a closer cohesion of the group sooner on the first day. It was meant for brainstorming and for an initial collection of ideas in small groups, followed by plenary discussions for an open, group exchange of ideas, comments and questions. The Card Collection was employed in order to gather individual ideas and provide group discussion. It was also scheduled so that a link could be made between the first day's outcomes and the opening of the second day's session. Thus, it had a dual purpose of collecting ideas for discussion and providing a refresher of the previous day's events. In addition, more time was given to the plenary sessions in order to discuss good practices and outstanding issues. As a concluding interactive session on the third day, the group was divided into two teams to write the above mentioned "Dublin PLA Charter." 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 10 peer learner countries present at the meeting: Austria, Belgium, Denmark (leading country), Estonia, Ireland (host country), Norway, Slovenia, Sweden, Switzerland and Turkey. There was representation from the European Commission and the three external consultants had moderator and rapporteur roles.

3. Early Career Researchers: Recruitment and Careers

3.1. Who should do what to promote early career researchers?

In order for the status and environment of early career researchers to improve, a clear understanding of the roles and responsibilities of the different stakeholders is needed. Researchers themselves are an important voice in the efforts to ameliorate their conditions. In addition, HE and research institutions, research funders, national and state governments, the EU, and the private sector as well as others can enact strong and effective measures to ensure there is adequate support and opportunities for innovation and mobility.

In the Gallery Walk, the questions discussed were: *Who should do what to enable early career researchers to develop their careers in research and innovation in the best possible way? And what should they NOT do?* Each group added their comments to each of the 6 "paintings": What should the researchers, the institutions, the research funders, the state/government, the EU and others do?

The outcomes are presented in the following table. Recommendations focused mainly on developing strong and effective policies, providing adequate funding, supporting researcher careers, training, and experiences (including international mobility), supporting researcher conditions, promoting links and collaboration (between stakeholders and sectors), promoting programmes and research, removing bureaucratic and legislative barriers, being active in the research area, and improving communication (at all levels).

Gallery Walk Outcomes

Role	
Researcher	<u>Conduct Responsible Research</u> • Do excellent research • Be confident and ambitious about own research • Communicate value of research • Promote the education value of research work • Develop interdisciplinary approach in research • Do not give away research ideas <u>Be Active in the Profession/Field and Beyond</u> • Actively develop networking • Collaborate with academic colleagues and private sector • Publish • Pursue commercialisation opportunities • Actively seek early funding – do not rely on the Principal Investigator (institution should take responsibility as well) <u>Gain Broad Experiences /International Mobility</u> • Be open minded, go abroad, go to conferences • Participate (more) in international mobility, also early in the career • Be mobile, don't stay in the same group too long • Do not just be a "lab rat" <u>Be Professional</u> • Be familiar with the EU Charter and Code for Researchers • Inform policy • Learn transferable skills • Participate in further advance skills modules if available • Ensure work-life balance from the early career stage • Take ownership of career development • Do not assume a single academic career path • Be very clear why you start a PhD <u>P.I. (Principal Investigator)</u> • Assume responsibility for career development • Value diverse career paths • Facilitate reintegration of ex-career • Be honest – do not promise too much
Research / Higher Education Institutions	<u>Ensure Policy and Authority Role</u> • Inform/make policy • Respect legislation • Monitor and identify challenges • Manage conflicting priorities of the institution, e.g., PI vs HR • Involve researchers in institutional governance, incl. early career researchers • Do not be self sufficient

	Support Research Careers and Training • Transparent communication of career opportunities • Recruit also from private sector • Develop quality programmes for research training subject to external evaluation • Provide transferable/generic skills opportunities (big challenge) • Support career opportunities outside academia • Create transparent career paths • Offer English doctoral training programmes • Do not treat those who leave academia as failures Support Researcher Conditions • Preserve academic freedom • Sign fair contracts • Promote academic responsibility • Develop family supportive structures for better work-life balance • Implement and put into action the Charter and Code for Researchers Promote Links and Collaborations • Develop (better) links to stakeholders (incl. industry) • Develop active co-operation and dialogue with external stakeholders • Actively support inter-institution engagement
Research funders	Support Researcher Experiences and Careers • Focus on the researcher's career development in all funded projects and programmes • Encourage collaboration between young and established researchers • Ensure funding for enhancing skills, e.g. Roberts funding • Be international and open – take the best candidates and use international peer review • Do not just focus on established researchers Support Programmes/Research • Incentivise programmes which combine development of career with research agenda • Ensure implementation of Charter and Code within programmes • Ensure sustainability of programmes • Fund high risk/groundbreaking research and cover all expenses – full economic cost • Use instruments (awards, etc.) to promote research as such, i.e. make research careers attractive Remove Bureaucratic and Legislative Barriers • Allow ECRs to apply for funding even if not PI • Ensure mobility/portability • Do not create administrative burdens Maintain Balance • Balance between funding of projects, individual researchers and infrastructure (equipment etc)
State / government	Develop and Improve Policies and Funding • Communicate, be consistent, be reasonable • Develop policy to support skills and training (job of institutions and universities) and stick with it • Promote open recruitment legislation (including non-EU immigration) • Promote policy for encouraging mobility (including financial incentives) • Coordinate labour laws among MS • Coordinate between government departments • Avoid shifting policies and short term decisions • Provide reasonable level of basic stable funding • Avoid uncoordinated approaches, misalignment with needs, funding not following policy • Do not threaten university autonomy

	Be Active in the Research Agenda • Engage with the research community • Communicate and promote the value of research • Ensure a good balance between top down and bottom up research • Build up good framework conditions for autonomous sustainable research Be a Liaison for Industry and the EU • Develop structured career path between sectors • Encourage inter-sectoral mobility (e.g. Industrial PhD) • Develop incentives for business engagement • Build effective liaisons at EU/gov. level Improve Researcher Conditions • Believe in and implement the Charter and Code • Provide proper social security provisions to researchers • Broaden platform to facilitate agency-HEI, PI-researcher relationship • Avoid unnecessary visa restrictions
EU and others	**EU** Remove Bureaucratic and Legislative Barriers; Improve Communication • Simplify the application process and admin procedures; adapt criteria to early career researchers • Coordinate labour laws • Provide targeted and relevant smart information on EU developments, no "EU speak" Support Researchers: Promote Mobility and Careers • Promote but do not impose mobility and help reduce obstacles • Be active in the management of mobility to ensure brain circulation • Provide more coordination between mobility centres (related to third country researchers) • Consider future markets for jobs for researchers (academia should not be a direct supply line for certain markets) • Promote flexibility and multiple careers Develop and Improve Policy and Funding • Implement EU researcher policy in all EU funded programmes • Reduce fragmentation • Do not micromanage • Do not base policies on short term needs • Provide adequate funding **Private sector** • Change the perception of the PhD and value it • Invest in R&D • Promote PPP and participate • Identify needs and speak with other stakeholders

Researcher experiences: the Irish Context

While improving the status and conditions of early career researchers is imperative, it is also important to understand the experiences of these individuals and how the policies affect them. In line with this idea, the Irish Universities Survey was presented. This is the first comprehensive study to measure the experiences of 3^{rd} and 4^{th} level students and researchers in the seven Irish universities. It is sponsored by the Strategic Innovation Fund (SIF) and allows universities to perform self-interrogation, policy and practice that are rigorously evidence based and can assess the impact of these policies (for main outcomes, see presentation; full report on line[21]).

[21] See: http://www.iua.ie/iua-activities/documents/IRISHUNIVERSITIESSTUDYv510-08-09.pdf

The study cites the increasing numbers in PhD students and that these numbers will fall unless a new cash injection is made. The demographics show a trend of growth in non-Irish population at around 35% (mainly India, China, United States, and Russia) but that the recession has led to an increase in Irish PhD students. The survey showed levels of satisfaction with the PhD experience as high in general. While many found it an interesting and/or a rewarding experience, for many others, it was frustrating and lonely. 60% of international students indicated they would leave the country after graduation. Career expectations were overwhelmingly a research position in the public sector. This is cause for concern: over the years, a good funding system has been put in place, but it has built up expectations that cannot be realised. There are not enough positions in academia to absorb all those aspiring to an academic career and funding is bound to decrease.

The role of the IUA was characterised as follows: 1) developing common policies across the seven Irish universities – e.g. 4th level Ireland, cooperation in graduate education (creation of a single point for attracting international students through a website, but with each university attracting its own students); 2) developing projects on topics such as full economic costing, teaching and learning, research (a new website is being developed with peer review of all research on line to promote the sector collectively)[22]; 3) developing services: e.g., acts as National Contact Point for the EU Marie Curie programme and as bridgehead for EURAXESS, Steering Group Human Resources and Mobility (SGHRM).

Irish research is supported by Science Foundation Ireland (SFI), which was established in 2000. It has taken Ireland from a standing start in research to its current position and has become a key organisation in the implementation of the Strategy for Science, Technology and Innovation 2006-2013. SFI is a multi-component player and part of a wider system of funding along with the HEA and other instruments of government funding. It has developed a new strategy in light of the economic crisis based on four interrelated pillars: human capital, quality input, global reputation and knowledge transfer. In terms of human capital, it seeks to build a critical mass of internationally competitive research teams in Ireland in the sciences and engineering underpinning BIO, ICT and other scientific areas.

In the context of early career researcher status and employment conditions in Ireland, key note speaker Prof. Maguire presented the Advisory Science Council and its activities and work programmes on different topics, focusing in particular on the report[23] on the role of PhDs as a driver in achieving a knowledge-based economy. The report acknowledged the strengthening of the research structure but identified the need to develop a more ambitious agenda for innovation. It highlighted the critical recommendation of the SSTI (Strategy for Science, Technology and Innovation) to double PhD numbers in Ireland but it was not clear how this would transform into enhanced innovation. It also highlighted the need for R&D active companies to hire more PhD researchers to bring greater absorptive capacity, which is much more than the companies might imagine: new knowledge, new working methods, personal network and ability to solve complex

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22 This refers to a new site to access Irish Doctoral/Premier Research and National Bibliometric Data. More information can be found at: http://www.iua.ie/iua-activities/strategic-innovation-fund.html

23 *The Role of PhDs in the Smart Economy*, Advisory Council for Science, Technology and Innovation. December 2009. See: http://www.sciencecouncil.ie/media/asc091215_role_of_phds.pdf

problems. In the interim period since publication, the economic situation changed dramatically and the report has become even more important.

The report recommends:

- Align funding with sectors of economy with a demand for PhD researchers (an ambitious task – there is a need to stimulate new areas of demand);
- Embody the inverted T model of broad understanding of the discipline, transferable skills, and specific expertise;
- Engage with industry through formal consultation in the development of structured PhD programmes at discipline level within the institutions;
- Create a user friendly and centralised system to allow employers or potential employers to access information on the number of PhD students in the pipeline and the broad theme of the research;
- Value the Enterprise Partnership Scheme which links private enterprise and eligible public bodies to co-fund postgraduate scholarships and postdoctoral fellowships, make resources available to scale up the programme;
- Develop an industrial PhD programme along the Danish model;
- Ensure an integrated programme of support and training from PhD education to post doc to enable the commercialisation of research.

3.2 . Enhanced researchers' skills and career development

Across Europe, the structured PhD model is increasingly replacing the traditional apprenticeship model. A postdoctoral system which encourages mobility early in a researcher's career is likely an important aspect for a pan-European approach to researcher career structures. For more established scientists, tenure-track appointments and opportunities to lead research groups are features that would further allow researchers the independence and flexibility needed to promote creativity and innovation. In addition, continued professional development of experienced researchers is gaining importance. Adequate funding and effective policies must be in place to support these measures in order to be successful, an obligation that research funders must be ready to fulfil. As the education and learning aspects have greater prominence in the newer PhD model, these must not replace the primary function of the PhD – original research and the creation of new knowledge, products, processes, methods and systems.

Country examples and discussion outcomes

Ireland's structured PhD model was described in a keynote presentation as an example of enhancing researchers' skills and career development. There have been a number of developments since 2003. The following shifts were identified:

- from traditional to structured doctorates
- towards incorporating professional/career skills
- towards advanced specialist taught modules across university sector
- towards incorporating non-academic experiences
- towards increasing quality and numbers of doctoral candidates
- towards increasing monitoring of early researcher's professional stages lifecycle

The key players and the policy context of the changing Irish doctoral education system were also highlighted and this change was compared to "stopping a tanker and changing direction". Nevertheless, progress has been made. Programmes have moved from a traditional model to a structured model. Investment in research training is relatively secure despite the economic crisis and there is an increase in the monitoring of research training and information. There is a combined national and institutional effort to develop graduate governance and to decide policy, linking research training with key stakeholders in the area of socio-economic development. Lastly, improvement in the early stage research experience has been made and there is inter-institutional collaboration for quality programmes.

Various strategic funding initiatives to support these changes are in place, such as the competitive funding programme for research in third level institutions (PRTLI, currently in its 5th cycle). In addition, a benchmarking exercise[24] by the seven universities was developed to help guide development of and innovation in Irish graduate education. It looked at best practices internationally, principally in the US and UK and led a concise description of what a structured Irish PhD is.

An example of the introduction of the structured PhD programme can be seen at NUI Maynooth where all students enrolled in 2010 now participate in this PhD model. There has been an enormous amount of change that has taken place in a short space of time and which has raised a number of questions that are still being debated.

Three countries presented their specific cases of PhD models and enhancing researcher skills and development: Denmark, Switzerland and Slovenia.

In *Denmark*, as part of the Danish Globalisation Strategy 2006, a decision was made to increase funds and enrolments in PhD programmes. Following the reformed PhD structure in 2007/8, there was a significant increase in enrolments (with the biggest increase in natural sciences) and increased international co-operation, including double degrees. There are a number of characteristics of the PhD programme: closely regulated by ministerial framework and institutional regulations, structured programmes, PhD schools (independently or in cooperation), salary, social rights and benefits as state employees, and an average age of completion of 35 (which allows for professional and life experiences to be gained prior to beginning a PhD). As a specific example, the PhD model at Aarhus University was presented. The aims and objectives of the university include the following: become quality comparable with the best in the world, recruit top talent, double the number of researchers by 2012, and implement a researcher development programme for talent from bachelor level onwards. Eight schools will be merged into four following international consultation. The university has a specific action plan for recruitment and admission, internationalisation, quality assurance and the job market, though some challenges remain, including: devising an open and fair application process without getting overloaded, implementing career coaching as an integral part of PhD programmes, promoting transferable skills, fostering a better dialogue with external employers to increase awareness of the added value of PhD hiring.

For *Switzerland*, when referring to the ERAWATCH country report from 2008, 'well-paid researcher positions and a good scientific infrastructure in both the private and the public domain attract highly qualified researchers from other countries that are needed in order to cover the demand for researchers which could not be covered by domestic scientists.'[25] The representatives from

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[24] This was the IUA 2004 Conference which led to the 2005 IUA submission to the government entitled '*Reform of 3rd level and creation of 4th Level Ireland*' dealing with how to secure a competitive advantage in the 21st century (2005)): http://www.iua.ie/publications/documents/publications/2005/Reform3rdCreation4thlevelBrochure.pdf .

[25] See: ERAWATCH Country Report 2008 — An assessment of research system and policies — Switzerland http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&topicID=4&countryCode=CH

Switzerland (Rectors' Conference of the Swiss Universities (CRUS) and the State Secretariat for Education and Research) noted that the internationalisation of the Swiss Research System means that 47% of doctoral candidates and 45% of professors are from abroad and there is also high outward mobility. There is a challenge concerning diversity in terms of structured education and supervision but the number of structured doctorates is increasing and they share common objectives: significance of the doctorate with regard to research, a focus on development and innovation, promotion of academic competence, subject-specific degrees, development of methodological and transversal skills and knowledge, and the promotion of academic interaction and networks. A number of good practices could be highlighted and included diversity as a valued asset, multidisciplinarity, excellence, doctoral education as a key concern, supervision (co-direction), transferable skills, academic interaction, mentoring. Lastly, some challenges persist in the Swiss HE landscape, such as the underestimation of the doctorate in the labour market, the difficulty of embarking on an academic career, the recruitment of promising scholars, the status of doctoral candidates, the working conditions and commitments outside the work on the doctoral thesis, general support of candidates, drop-out rates of female researchers (due to family commitments and a lack of support and networks).

Slovenia has in place a Young Researchers' Programme since 1985 to raise quality and strengthen human resources in science through postgraduate training and participation in R&D projects. Researchers are offered fixed term contracts with full social coverage and pension rights for 3.5 years. There is the problem of employability after the programme with little chance of obtaining a post doc. The process of recruitment is top down with supervisors applying for funding in order to encourage more applications in technical fields. It was considered to be better to create a combination and allow researchers to apply as well. A second programme, called Young Researchers for the Economy, is co-funded by the EU social fund and seeks to create new jobs, raise the number of researchers in the economy and improve the education structure of employed researchers. An analysis of the programme highlights a growth in financing in recent years, with structural changes in favour of life sciences, technical sciences, agriculture and humanities. The number of PhD holders in R&D has grown, with 47% of them being women. Only 10% are employed by the private business sector and the current economic crisis has worsened unemployment levels. The new action plan for the implementation of the European Partnership for Researchers promotes science in schools, focuses on early career researchers in transition from training to employment, highlights industry-academia co-operation and develops new instruments and programmes for the implementation of the EPR.

Based on the country examples, it is clear that there are a large variety of ways to organize the structured PhD model. As a general result, this organization should be based on the objectives sought and necessitate the appropriate instruments to align with the objectives

The table below gives some examples of possible objectives and corresponding related instruments.

OBJECTIVES	RELATED INSTRUMENTS
Create elite doctorate groups	Selective approach for financial support for PhD programmes ,make them part of excellence initiatives
Meet specific national needs	Thematic orientation of supported PhD programmes
Professionalization, skill development	Integrate generic skills training, research skills training, "inverted T" in structural doctoral programmes
Promote Interdisciplinarity	Promote Recruitment of PhD candidates from various disciplines within one programme
Establishment of team culture, cooperation	Requirement of inter-institutional cooperation for funding of PhD programmes
Improved governance (recruitment, evaluation, monitoring...) and quality	Selection process, evaluation, progress monitoring, coaching as part of the programme
Overcome traditional problems (old-boys-networks, „slavery", duration)	(International) panel to supervise PhDs instead of only an individual supervisor
Employability, employment needs (incl. private sector)	Analyse perception of PhDs and skill demands of industry, realize an industrial PhD model, look for enterprise partnerships

3.3. Status and employment conditions of early career researchers

Early career researchers are often not only confronted with the challenges associated with entering into and establishing a (good) reputation in a scientific field, but also with issues related to their status and employment conditions that could potentially impede their research and further professional goals. Early career researchers should be considered as 'professionals in training' with rights equal to those of more experienced researchers. MS vary in their conception of the PhD candidate as a student or as a researcher, which should normally imply a salaried work contract. This difference is not only a matter of semantics as employment conditions often depend on how the individual is classified and can largely determine future career opportunities. Enhancing the researchers' status and employment conditions across Europe is a particularly salient issue and will be expounded upon in the following country cases.

The reflections of participants on the most important problems regarding the status of early career researchers and conditions that make research careers for early career researchers most attractive were brought together in the Card Collection exercise. The outcome is summarized in the section on "Lessons learnt".

Country examples and discussion outcomes

Ireland:

Dr. Simpson of Science Foundation Ireland (SFI) spoke of how research funders can support research careers. The focus is changing from individual researchers to large teams and interdisciplinary consortia in a period of an increasing pace of change and degree of complexity: researchers feel greater pressures to publish, a need for a stricter adherence to research integrity, issues of financial support, the need for a diversity of skills, a need for mentorship and leadership training, a need to be more sensitive to public perception and the media, and a need to address questions of quality vs. quantity.

Researchers are closely monitored and tracked. There are signs that there is a problem of providing jobs for post docs and this raises the question of whether they are being given the right training in translational research and entrepreneurial skills.

There is a need for global skills for research, whether commercial or academic, including:

- Research integrity – how to mentor, collaborate etc
- Grant writing
- Publishing research findings – understanding how to publish
- Public communications and the media
- Ethical issues
- Mentorship (an increasingly important aspect); how to determine who makes the best mentors

In addition, prestigious young researcher awards for exceptional research quality are in place (The President of Ireland Young Researcher Award - PIYRA) and there are future plans for additional rewards. Other awards include the Starting Investigator Research Grant SIRG set up in 2008 where awardees are mentees but also mentors, and the principal investigator career advancement award (PICA) which operates as a career break mechanism (recently integrated in the general Principal Investigator Programme).

Plans for the future include a seven year duration for some awards, greater commitment from the host institution (such as tenure track), the promotion of co-funding models with European and other international partners, improved training and mentorship for example through master class workshops, encouragement for ICT submissions, and international recruitment to bring in international talent.

SFI encourages mobility and international training and experience and also offers some short term travel fellowships. However, this is not its principal purpose and other agencies offer mobility grants. SFI also evaluates the awards and programmes to understand the successes, rather than just turning out numbers. It communicates with the researchers and invests time speaking with the research community to better understand issues or positive outcomes.

For the future, SFI is looking at how to provide:

- Longer term security for researchers
- Robust and fair evaluation and monitoring of progress
- Opportunities to encourage mobility and international exposure, while retaining and attracting back the best talent
- Additional support in terms of resources and training, as well as mentorship and leadership for research integrity

Also in *Ireland*, based on the desire of early career and contract researchers to be better represented in the policy development process, the Irish Research Staff Association (IRSA) was created through a bottom-up approach. Its aim is to provide an information service and create a network to avoid isolation. It presented itself as a voice for researchers and is the only research staff association in Europe (not a trade union) that is fully operational. It operates as an umbrella organisation for the research staff associations at five universities, catering to post docs and research staff. Its strategic goals are to:

- Represent Irish researcher interests in relation to career development and work conditions
- Enhance the public image of researchers in Ireland
- Promote researchers as an essential part of Ireland's smart economy
- Seek European direction, conclusions from directives and established codes of conduct

It has ambitious goals for 2010:

- Lobbying for improved employment conditions
- Developing a career structure
- Engagement with national funding bodies
- Skills for developing research careers via forums and workshops
- Developing a national researcher network
- Expanding IRSA to encompass more Irish and UK universities

The Association's main priorities include reforming the research career path, promoting uniform salary scales, and giving more say to researchers on fixed-term contracts (they are currently not able to apply for external project funding). In the background, there is always the challenge of the indefinite contract duration. An on-line survey was conducted in 2007 to examine the issue of researcher contracts which highlighted the short term nature of their employment and the lack of funding opportunities.

Other countries have different models for researcher representation and how researchers are involved in governance and decision-making processes. Examples include the following:

Norway: Researchers are represented on governing boards but without an association to support them, which makes their efforts less effective.

Germany: There is a change of the governance structure to a more managerial model and a chance to be involved in strategic processes rather than in collegial bodies.

Sweden: There is a similar movement as in Ireland at Karolinska Institute which is spreading to other universities.

Denmark: The national PhD association does not do much at the national level, though at the local level, they might promote interests. Trade unions are strong.

Slovenia: The PhD association is similar to that of Denmark.

Sweden introduced reforms which increased efficiency in doctoral training through improved funding. The 1998 reform aimed to strengthen improvements already taking place by restricting admission to those with funding for full or part time (50%) studies, limiting the duration of grants, creating a mechanism to turn grants into salaried studentships and introducing follow-up mechanisms. The changes were heavily contested as a risk to quality and to the diversity of applicants, but they have been largely successful and are now widely accepted. Doctoral candidates are considered both students and researchers and should normally be employed.

Sweden offers two official forms of funding:

1. Doctoral study grant - fixed, not high, taxable, some pension rights, on a par with other student funding
2. Salaried doctoral studentships – regular employment salaries negotiated between employers and trade unions

There are also other forms of stipends and scholarships. Good funding conditions for doctoral candidates are important to enable recruitment levels that meet the needs of academic research and the larger labour market, quality of selection and full time studies.

The institutional perspective of Umea University was offered as a concrete example in the Swedish HE system. Doctoral candidates are recruited and admitted through a transparent process via the university home page and opportunities are advertised nationally and internationally. Doctoral studies are financed primarily with studentships, and employment as a doctoral candidate lasts for four years with grants or, in exceptional cases, with tax-free stipends. The Industrial Graduate School is a unique partnership between the university and industry giving the opportunity to complete studies with employment outside academia. Social insurance covers everyone who works in Sweden and includes maternity and parental leave, illness, work injury, etc., and the (post)doctoral grant/studentship is prolonged for the length of leave. However, it is not offered to those on a stipend, and this creates tension. The University offers 100 young researcher awards with up to 100,000 euros for two years open to researchers up to ten years after earning a doctoral degree.

Belgium is convinced of its good level of scholarships and salaries and PhD status as well as the need to improve career development and to implement the EU Charter and Code and EPR. There are several different employment models which vary as follows:

1. Personal PhD grants (tax free and financed by universities) are limited to graduate students (max 48 months) and post docs in international mobility (max 36 months)
2. Employment contract as a research assistant financed by structural funding of universities (min 50% doctoral research, though this calculation is difficult to monitor and enforce)
3. Project fellowships

Young researchers are covered fully by social security whether they have an employment contract or are supported by grants/fellowships, but non-EU researchers may have only partial coverage.

Early stage researchers are recruited internationally although there are still some recognition difficulties with education qualifications. Recruitment is mainly through public procedures, but personal contacts are also important. Efforts to implement the European Partnership for Researchers are being made as well as links developed via EURAXESS such as jobs through www.euraxess.be. Salaries and fellowships are attractive and compare very favourably with other European countries. Benefits include low cost of studies and living, access to student discounts and mobility opportunities. A main challenge is that there are few opportunities for academic careers. Universities are therefore expected to take responsibility to facilitate the transition to the labour market by enhancing employability through research skills and generic transferable skills. It is also important to make the labour market aware of researchers' competences through stronger links to industry and shared responsibility/co-funding models and post doc experiences.

Estonia has a strategy to increase the number of PhD graduates and improve the efficiency of PhD studies. Doctoral candidates are students, not employees and may or may not be funded by the state. Funding goes to the universities and universities have no obligation to pay allowances which leads to inefficiencies (the graduation rate is around 30-40%) and irrational behaviour (the State does not receive what it needs in terms of PhD graduates and universities accept students without the resources to train them). Solutions will be ushered in starting in 2012, when all full-time doctoral candidates will have the right to receive allowances and universities will have the obligation to pay. Dual status will be introduced: a choice between student status with student rights and obligations or status as an early stage researcher (employee) with all student rights and parental benefits, pension contributions, allowances and a solid contract between the candidate and the university.

In *Turkey*, there has been significant change following a banking crisis almost a decade ago. Efforts have been made to increase the number of international researchers (facilitating access and providing more information) and to improve the climate for national researchers through the development of a new strategy and the implementation of new instruments and programmes. Direct public funding for R&D and innovation has been made available to boost innovative activity and capacity development. The International Researchers Coordination Committee works with regulatory issues. The IRCC was set up in 2008 and is composed of relevant authorities from the Ministry of Finance, Ministry of Education, Ministry of Health, Ministry of Industry and Trade, Ministry of Foreign Affairs, Ministry of Labour and Social Security, The Council of Higher Education, Directorate General of Population and Citizenship, Ministry of Interior General Directorate of Security, Intra-University Council and Scientific and Technological Research Council of Turkey (TUBITAK). TUBITAK runs the Turkish EURAXESS Portal to provide information to researchers. Other committees work to improve research climate, improve conditions, create university-industry collaborations, draft science and technology human resources strategy and promote innovation. A series of research fellowship and scholarship programmes have been set up open to national and international applicants.

A comparative conclusion from country cases was that there are different strategies depending on the objectives or the national system and the degree of autonomy. Coherence is organised in a variety of manners:

For the status of young researchers in *Belgium*, several legal options are foreseen (salary; fellowship with full social security), from which universities can select the one that best fits the situation.

Sweden opts for programmes which are also designed within universities.

Denmark sets standards for everyone but allows for university discretion to develop their own systems.

A special issue across Europe concerns employment contracts. Indefinitely renewing fixed-term contracts to avoid offering post docs permanent positions are counter-active to fostering researcher independence and creativity. It creates a climate of insecurity and does not promote employee loyalty. This perpetual holding pattern ended with the EU Fixed-term Work Directive[26] essentially requiring employment on a contract of indefinite duration after four years on a fixed term contract. This ushered in significant changes since researchers were to be considered equally whether on a permanent or a fixed-term contract. The aim of this directive was to ensure that researcher performance would not be undermined by employment instability and to prevent abuse by employers from using successive fixed-term employment contracts, thus side-stepping permanent employment. However, an adverse effect resulted insofar as it created a large degree of fear on the side of the institutions that if the researcher was in the system for more than four

[26] 1999 *EU Directive on Fixed-Term Work*. See: Council Directive 1999/70/EC concerning the "Framework Agreement on fixed-term work" concluded by ETUC, UNICE and CEEP, adopted on 28 June 1999

years, they would become entitled to a permanent position. Permanent appointments are not readily given by universities, who may not have the necessary funding to support these permanent positions and who also may not want to commit to a specific individual who would become an "employee for life."

Due to employment law liabilities, universities therefore often found it difficult or even impossible to offer further employment to non-permanent researchers after the maximum allowable period of employment on a fixed-term contract. This is creating problems across Europe as universities feel compelled to end the employment relationship altogether when the time limit for employment on fixed-term contracts has been reached, often causing the researcher employment conditions to be even more precarious. This has had an impact in a number of countries and is the root of a number of issues as noted in the presentation of country examples. A possible solution has been adopted by *Denmark* and *Austria* where researchers and academics are no longer civil servants for life in general, alleviating the pressure experienced by universities when they have to decide what to do with their post docs when their time limit has been reached.

3.4. Transparent research career development

A number of issues are crucial for transparent research career development, including the provision of mobility opportunities (cross border and intersectoral); the promotion of equal opportunities in the context of gender, family obligations and diversity; developing diverse career paths (qualifications after PhD, requirements to become a professor, tenure track possibilities); HR development: institutional planning, continuous training, coaching, etc. All these aspects are reflected in the European 'Charter and Code'[27] which establishes a reference framework for researchers, employers, and funders.[28] The following country examples provide a glimpse of current and planned initiatives for transparent career development in selected MS.

Country examples and discussion outcomes

Ireland:
In his keynote presentation Mr. Martin Hynes (Director of the Irish Research Council for Science, Engineering and Technology IRCSET) presented the Enterprise Partnership Scheme which co-funds scholarships and fellowships at postgraduate and post doc level with companies. The scheme has facilitated collaboration between industry and academia, producing a remarkable response with 90 companies involved in 200 co-funded partnerships. It has generated benefits for the researchers including mentoring from industry experts, training in transferable skills, enhanced employability, and exposure to commercially orientated research environments. It has also had significant value for the companies such as access to talented researchers and potential future employees, easier dialogue with the wider research community, low cost collaboration, and maximisation of their potential for innovation.

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[27] "The European Charter for Researchers / The Code of Conduct for the Recruitment of Researchers," European Commission, Brussels. 2005. http://ec.europa.eu/eracareers/pdf/am509774CEE_EN_E4.pdf

[28] Further literature addressing the topic of transparent research career development includes the report by the European Science Foundation's 'Member Organisation Forum on Research Careers' entitled 'Research Careers in Europe: landscape and horizons'[28] and the report by the League of European Research Universities (LERU) 'Harvesting talent: strengthening research careers in Europe'. In these reports, the role of research funders and institutions is emphasised as particularly important in offering stimulating career paths as well as attractive research conditions.

Despite these successes, there are still issues to be addressed:

- How to foster wider economic return that goes beyond just commercialisation
- How to be attractive for the company while maintaining focus on the researcher
- How to deal with issues concerning intellectual property, such as who owns the idea and resulting spin-offs
- How to approach SMEs vis-à-vis larger companies
- How to maintain flexibility and patience (the process takes time to incubate – about 6 months to a year)

Norway is encountering many challenges similar to those experienced by other European countries presented during the PLA, namely the rapid increase in the number of early career researchers, the need for political commitment to build up competence, and the lag in the perception of roles and prospects from industry and employers. The national labour and employment regulation is similar to Ireland with four year limits to contracts. In general, there is an outdated career structure, rigid frames for fixed term contracts, and influential trade unions (which are unable to negotiate with the flexibility seen in Belgium).

The specific institutional challenges of the University of Oslo include how to make aspirations reality, long term vision versus limited responsibilities and adjusting to the new demography. In addition, doctoral training is due for revision (adjustments coming through the EQF) and transferable skills are to be made explicit. Postdoctoral and project funded researchers are also a main concern. Regarding senior management the active use of HR policies in the framework of developing institutional strategies has not been practiced much in the past.

A good bottom up practice at the University of Oslo could be highlighted. To support the career development of young research group leaders at the Biotechnology Centre of Oslo they are offered “5+5 contracts” with an assessment in year four, a substantial starting package and the ability to hire their own staff, set their individual career plans and develop management/leadership skills. Progress is evaluated annually. This is seen to be a kind of “hot house”, but to fully develop its potential this kind of approach needs to be integrated in the institutional strategy which is not yet the case. The University has also set a new HR agenda. The endorsement of the ‘Charter and Code’ in 2009 and a new top leadership which implemented a strategic review helped to move the process forward. Within the framework of the European Commission’s initiative “HR Strategy for Researchers incorporating the Charter and Code” (which is completely voluntary), an internal gap analysis for the ‘Charter and Code’ was carried out. The resulting background document informed the development of the overall institutional strategy, in particular regarding researchers’ needs for professional development. The university had the extra motivation of seeing other institutions move ahead, both in Norway and in other European countries. The results so far have been a clear focus on research career development and an action plan for academic staff. The progress achieved so far has been acknowledged by the European Commission through the award of the logo “HR excellence in research”, which so far has been awarded only to a small group of institutions across Europe.

The new HR agenda has established a number of criteria, including recruitment in compliance with European ‘Code of Conduct for the Recruitment of Researchers’, follow up of temporary researchers (career development, generic skills, mobility), professional development for all staff, and protected research time – balance between teaching and research. There is a long term plan for researchers on fixed term contracts to provide transparent recruitment and career paths, define criteria for proper use of fixed term contracts, enable employment on contracts of indefinite duration with external funding, offer career counselling and individual career plans, increase the use of mentors (for female post docs in particular), continue to develop PhD programmes and develop skills for research and mobility.

Austria presented the career model of the Medical University Graz. Since 1 January 2004, universities are autonomous but financed by the government and since 1 October 2009, they have a collective contract, whereby all staff are evaluated. These evaluations can influence careers in a positive (position of indefinite duration, higher salary, offer of qualification contract for high potentials) or negative way (end of contract). The researchers themselves are involved in developing transparent career development through involvement in the Personnel Development Committee, workshops and negotiation of the agreement in the qualification contract. The qualification contract for young scientists (assistant professors within 2 years of starting their job) occurs in 4 steps: 1) planning of the structure, 2) assessment of employees, 3) contents of the qualification contract (research, instruction, academic administration, management and soft skills, clinical work presented as a draft, discussed by Personnel Development Committee along with self-presentation of performance, targets, vision, leading to a recommendation to the Chancellor), 4) evaluation.

The university also offers support to develop and realise career ambitions that won it the prize for the best employer 2010 in Styria:

- Family friendly facilities (kindergartens and regular meetings for parents on leave)
- Health promotion (burn out prevention, sports facilities, etc.)
- Mentoring programme (includes training of mentors and mentees and evaluation in progress)
- Free in-house training and seminars – teaching, research, leadership
- WIN network – network for women in science
- Researcher/Teacher of the year award given by the Chancellor
- Career days for students
- Non-monetary reward system (in progress)

PowerPoint Presentations
All presentations are available at http://www.ubst.dk/en/international-cooperation/eu-crest-peer-learning-activities-on-universities

3.5. Lessons Learnt on Recruitment and Careers of Early Career Researchers

On the last day, participants were divided into two groups and asked to use their major insights and lessons learnt to identify the elements of a "Dublin PLA Charter." This charter-exercise resulted in a number of messages to policy makers. As a method, it was a useful tool to bring together important ideas which were highlighted and exchanged during the PLA event. The version below incorporates the messages from both groups, as well as the outcomes of the Card Collection exercise. It reflects the main lessons learnt on the following topics and presents the core findings from the PLA session:

- Optimal skills development and training of PhDs
- Best practice in recruitment, status and conditions for early career researchers
- Best practice in career development of early career researchers

In addition to the policy messages from the 'Dublin PLA Charter' exercise, other important lessons learnt were noted during the plenary interactive discussions on good practices with presenters. In addition to skills enhancement, researcher conditions and career development, other major aspects where good practices and experiences were brought into discussion regarded structured PhD models, links with industry and governance issues. Factors that emerged which determine the attractiveness of research careers include the importance of the national point of view, the employment/stipend/student issue, and the role of material vs. immaterial factors for researcher satisfaction.

There are set of special recommendations concerning governance which are relevant for the promotion of researcher conditions and career development. These include the following:

- **Governments and funding agencies need to provide enough autonomy for institutions** to develop programmes but also to protect their brand.

- **Flexibility should be built into every level**; it is most important not to over-regulate.

- **The aim should be to identify and encourage best practice and high quality** to attract top talent, rather than blindly trying to do the same as others who are currently successful.

- **Issues of funding and communication need to be considered** at all levels.

Policy Messages from the Group Exercise: The "Dublin PLA Charter"

Optimal Skills Development and Training of PhDs

A) *Skills and Training*

1. **There should be skills training and development as an integral part of the PhD** (for researcher integrity, ethics, mentoring skills, writing grant applications, following deadlines, project management, and other soft skills etc.). Many of these skills are in fact acquired by conducting research and should be valued as part of the learning. The **research experience is key to this development**. It should be remembered that the core element of the PhD is the creation of new knowledge and skills are the tools you need to do the research, not the end in itself.

2. **The "inverted T" is a good general model to align PhD skills development with the needs of the economy** (broad understanding of the discipline, transferable skills, and specific expertise). Three fundamental skill sets can be identified: 1) specific skills for academic purposes and good research practice and integrity, 2) entrepreneurship, IP protection and commercialisation skills which can be carried over from academia to business, 3) project management skills: how to follow deadlines, present projects, etc.

3. **There should be a supported and systematic approach to developing professional qualifications and identifying skill set needs** for PhD candidates and early career researchers, in particular, through mentoring, peer learning, master classes, collaborative training, collective courses, etc. These should be employed at the beginning of their PhD training (concentrated in the first year but also with a progression) to identify where they

need specific training and should not be part of the accreditation or examination of the PhD. These skills classes should be coordinated through larger units if possible and in the context of a broad national framework so that generic skills are not delivered differently at the local levels.

4. **Skills development is not only a matter of training of early career researchers but also necessary for PIs (mentoring, supervision) and for higher education management.** For post docs, it is advisable to be mentored but at the same time already to be a mentor. For those interested in higher education management, this would help to enlarge career perspectives within academia and to reduce misunderstandings between academic and administrative worlds.

5. **Universities should offer the appropriate recognition of skills learnt**. A formalisation of the process would help ensure consistency and legitimacy. It should also be kept in mind that each PhD candidate is different and needs in terms of training will be different. **Individual planning and modular offers for competence and skill development are needed.**

6. **Structured PhDs make the programmes more internationally attractive** and should be promoted. The following questions should be considered: How much standardisation of a PhD model do we need and why do countries choose different ways to organise their PhD? Is it a question of size or federalism or something else? The Irish model may be good but may not be possible in Switzerland or Germany with their federalist systems, for example.

7. **Regarding structured PhDs, there should be some tight rules** – for example, the number of hours PhD candidates can work outside their thesis work should be limited to ensure the PhD does not take too long to complete.

B.) Career Development and Links with Industry

8. **Transparency of career paths is crucial. It is a major task of the university to use instruments like qualification contracts.**

9. **It is important to ensure the involvement of researchers at every stage of their career in institutional governance** so that they can have a voice in career path developments and other aspects.

10. **More consideration should be devoted to the question whose responsibility it is to organize and support researcher associations**. Institutions should support these associations but they should ultimately be up to the researchers to organize themselves.

11. **Institutions should incorporate the EU 'Charter and Code' for Researchers**, including maintaining integrity in terms of job postings, promotions, contracts and other aspects.

12. **There is a necessity for empirical data on potential career outcomes for PhD graduates** that should inform the development opportunities made available to them.

13. **There should be recognition in society of the value added education of PhDs** and that the added value of the soft skills acquired by PhDs make them immediately productive when they enter the labour market. **Communication with the private sector could change the perception of the PhD which is important for employment!**

14. **It is important to get industry involved in the training process early on**. Although industry views should not be the only factor in deciding what skills set PhDs candidates should develop, non-academic actors including industry should be actively involved in the dialogue.

15. **Improvements need to be made in the area of career guidance**. In this context, methods to be further developed include external coaching, individual conversations with career counsellors, and group discussions of issues not covered by the supervisor. Though not needed by all early career researchers, this can help to reduce stress.

16. **A personal career development plan that is reviewed regularly and other reflective tools in the educational experience are important to ensure researchers take ownership of their own development**. Responsibility should be shared between the researcher and the principal investigator. Funding agencies need to support these kinds of tools.

17. **Mentoring models at all levels should be considered. There is a necessity to explicitly recognize researchers' contributions to their projects**, such as co-authorship, mentoring responsibilities, the organization of conferences, training participation, and the obtaining of grants.

18. **Researchers should aim to have the right mix of skills for employment in their area of expertise**. Focussing on generic skills can improve employability, but skills development is also the responsibility of the employer. Different industries are looking for different PhD profiles. Some are interested more in the knowledge of the PhD holder while others are more interested in their skills beyond academic expertise.

19. **Establishing competence centres (for professional training and as exchange platforms)** which work with the university would help to solve specific problems with certain skills. These can be run by the private sector or supported by governmental or non-profit agencies.

20. **A crucial factor is to open diverse career perspectives and to introduce systematic HR development including with a view to careers outside of HE.** This is also relevant for the choice of skills to be obtained.

21. Regarding diversity of career paths, **PhD programmes co-funded by enterprises and implemented in cooperation with companies are a good practice** (cf. the Irish Enterprise Partnership Scheme), but **other measures also need to be considered to overcome obstacles between academia and industry**.

22. **Actions can to taken to improve the interaction between universities and industry to help promote researcher careers: Universities should make future graduate information visible** which would allow industry to know who is in the pipeline. **Industry can be involved**

on the university side by participating on advisory boards. In addition, promoting interaction between industry and early career researchers helps the researchers get a realistic view of the career options that exist outside academia. These are opportunities to get to know one another and bring together 'Mind and Market'.

23. **When trying to stimulate new demands from industry, a collaboration process should be cultivated through mutual exchange and mechanisms for researcher/industry involvement**, such as collaborative PhD programs (whereby PhD candidates not planning an academic career are co-financed by industry, possibly with a view to longer term employment after the PhD). Industry can benefit from innovative researchers and the generation of "hot houses" and spin-offs. As part of the consultation process, researchers need to use a language that employers understand such as E-portfolios that are readable by industry which can help smooth communication between sectors.

Best Practices in Recruitment; Status and Conditions for Early Career Researchers

1. **Active and targeted recruitment** whereby individual highly talented researchers are encouraged to apply for a specific vacancy can be very helpful to ensure the quality of the applicant pool. However, it is important to keep the process open and transparent, i.e. even if special care is taken that the information on the vacancy reaches the identified individuals, this should not *a priori* compromise the chances of other applicants. In particular, the recruitment process has to remain transparent, the selection criteria have to be clear and the procedure has to remain fair.

1. **To attract students to the field of scientific research, there must be clear added value of a PhD**. Financial reasons can be a strong motivation and thus, low incomes must be increased and HR policies of universities coordinated to offer attractive employment conditions. Financing of research and sufficient funds must be available to allow for the exploration of research fields of interest and to promote creativity and innovation. Career unpredictability due to short-term funding and a lack of vision need to be addressed while job opportunities should be enhanced.

2. **To attract researchers, framework conditions need to be improved in a variety of areas**. These include the security of employment, possibilities for tenure, competitiveness of the salary, level of social protection, and opportunities for international and inter-sectoral mobility. A number of other issues are important also, such as options for part-time work, longer term funding, ability to gain further skills, and support for researchers with families.

3. **To attract researchers, task and research related conditions need to be improved as well.** These include mechanisms to promote scientific and academic freedom and ways to foster creativity, the opportunity to conduct curiosity driven research, the relevance of research output, an interesting field, an interesting research project, and recognition of the researcher career. For research teams, the optimal conditions include a high quality team/group environment, peer group integration, and a stimulating research environment – teamwork, supportive and friendly colleagues, PhDs and senior researchers. Excellent supervision and mentoring is also valued. Lastly, infrastructure conditions are important and good working conditions depend on the quality of the lab and equipment.

4. **To attract researchers, a variety of conditions related to future prospects are also important.** These include good future prospects such as good job and career prospects, clearly presented career opportunities (knowing what is possible and what is not possible), getting the time to consider the career path, help in formulating a vision of the career path, and mechanisms to foster personal development.

5. **Special attention must be paid to the status of researchers, which needs to be improved** inside the institutions. Some aspects which should be considered include: the local academic culture, difference between traditional and structured programmes, the danger of PhDs becoming 'lab rats', rights and obligations of the P.I., exploitation by supervisors and institutions, isolation, generation gap, negative attitudes towards non-academic careers by supervisors and peers. In addition, PhD candidates are too often seen as learners rather than as scientific contributors and there is often the issue of whether the PhD candidate is a student or a researcher. Family obligations (including maternity) can hinder completion of a PhD on time. Lastly, social security measures must be improved.

6. **A good practice would be the introduction of more flexible contracts of indefinite duration which can be terminated in the absence of funds**. These long-term contracts are advantageous to both the institutions and the researchers: institutions maintain their best talent, researchers are happy, re-recruitment costs are reduced and other resources are not wasted. To support the sustainability of such contracts, researchers could be obliged to acquire a certain level of research funds themselves.

7. **A favourable approach towards the status of PhD candidates would be to give them both the benefits of employees and of students**. Regardless of the kind of contract or other agreement researchers may have, these should incorporate social benefits and mobility options.

8. **Measures must be taken to limit unstable career perspectives and post doctoral employment insecurity and pension gaps.** In many aspects, the status of PhD candidates is more secure than that of post-docs. For the latter, there are limited funds and opportunities, creating a need for a better framework and career structure for these individuals. **A critical issue for post-doc is the opening of access to funding programmes**, i.e. the right to apply for project funding in their own name.

9. **There should be flexibility in allowing people to move to different areas within the university** (not just in the research realm). In a dynamic system, there should be an awareness of other skills that these individuals may have and an ability to tap into this potential.

10. **Mobility issues must be addressed for foreign doctoral candidates and information on mobility clearly provided**. Facilitating the process for obtaining work permits for Third Country researchers is important for attracting top talent from abroad.

11. PhD candidates face many challenges such as demanding research requirements, pressures to have top general and academic skills, and unrealistic demands for graduation. **These pressures should be alleviated when possible and support mechanisms should be in place to help them cope with these demands**.

12. **For researchers with teaching or administrative duties, there should be guaranteed minimum time slots for research**, but in a non-bureaucratic way (no detailed time-documentation for research).

Special Good Practices

- The *Irish Enterprise Partnership Scheme* whereby not only funds but also infrastructure and networking are utilized is a good example of getting industry involved in the training process of PhD candidates.

- A good practice for recruitment procedures could be found from the *Norwegian* example whereby talented individuals are contacted and sought after to ensure highly qualified candidates. At the same time, the call for applications remains open to the larger community so that competition still features in the opportunity.

- In *Norway* efforts are made to put in place permanent employment contracts linked to the access to external funding. This kind of contract will hopefully enable institutions to offer more security to researchers on externally funded projects without impairing the institutions' need for flexibility and long term strategic planning.

- A good practice by *Belgium* regarding researcher status could be found. This model allows young pos-docs to have the benefits of employees and of students.

- Mentoring models (at all levels) such as the *Swiss* example of "Teach the Teachers" would be worthwhile in ensuring stronger skills for the mentors of PhD candidates.

- A good practice from *Austria* can be noted which involves courses in good scientific practice offered by senior scientists.

4. Evaluation of PLA methods

This fourth PLA confirmed the improvements made to the workshop design since the first and second PLA sessions in Copenhagen and Lisbon and the additional fine-tuning measures since the third PLA in Tartu. All participants answered the questionnaire, likely in part due to the inclusion of a specific time slot for filling them out, but also probably due to the desire to communicate their generally high level of satisfaction with the peer learning process and workshop discussions. There was unanimous feeling that the method of peer learning was useful and worthwhile in the context of the topic, early career researchers, in order to share and receive information from colleagues, with all participants assessing it as either extremely or very useful. The vast majority of the participants also felt that their expectations had been met, perhaps due to the fact that half of them were already familiar with the peer learning method, but also because the organization of the event had been tested several times in previous PLAs and improvements had been made.

As was the case for the first three PLAs, the Gallery Walk was particularly valued. One participant paraphrased the general feeling of the group by reflecting that this exercise "was a really excellent technique of generating open group behaviour and collecting high quality opinions." The Card Collection activity also scored higher than in previous PLAs thanks to better time allocation and specific slots in the schedule to discuss and revisit the outcomes. This provided the opportunity for participants to organize their thoughts and reflect on the major issues. As the topic addressed a whole number of important points often with relevant details to be noted (concerning employment conditions or PhD status, for example), the Card Collection was an ideal way to collect all thoughts and consider them from a larger perspective. The interactive workshop portion of the PLA which ended the entire session fit well with the PLA theme. Participants were given a creative way to articulate outcomes and best practices, drawing up their version of a researcher charter, dubbed the "Dublin PLA Charter." This activity was highly appreciated (scoring the highest in the survey) and fostered small group activity which brought forth new ideas and a chance for those who were not as vocal during the larger plenary sessions to express their opinions.

The workshop had been lengthened from two to two and a half days and participants seemed to take advantage of and appreciate this extra time for discussion. From the organizers' point of view, it also offered the possibility to explore an additional interactive activity without the fears of time constraints or early departures. Despite the advantages of a 2½-day workshop, one participant noted that two days would have been sufficient given the limits of the topic discussion and another suggested that the workshop be held in part over the weekend to facilitate attendance. It can be concluded that although 2½ days is ideal in most cases and an appropriate length for proper discussion and time for interactive sessions, two days is probably more realistic for attendance purposes. It would be interesting to explore the option of holding the additional day over the weekend, experimenting with 2½ days, or choosing either 2 or 3-day workshops depending on the topic. However, such an approach would need careful consideration as it would probably not be the preferred option for participants with families.

Major improvements noted by the participants concerned the provision of workshop material (presentations, information on the topics, etc.) in advance. Establishing timely interaction with the participants is crucial, either to receive the information requested (country information, participation) or to receive feedback on the information provided (guidelines on content and focus, presentation templates). This can be challenging given the difficulty participants sometimes have in finding the time to complete forms in advance or in the time frame requested. To this end, keeping informational forms succinct and only requesting a few paragraphs is imperative. For Dublin, less information was requested to describe the country case and responses came back much more quickly than for the previous PLAs. Regarding presentations, although the general quality was high, some improvements could also be made. A set format or template could be recommended to avoid presentations of a too general nature or which address the topic inadequately. Although this option was considered for this PLA, it was not implemented in order not to impose too many restrictions on the content of the presentation. An alternative could be to provide several different templates from which participants could choose. This would facilitate the comparison between country cases and ensure that presentations are more focused, without too much limitation on the freedom of presentation content. Follow-up telephone calls to ensure that participants understand the expectations concerning their presentation also proved to be worthwhile and would be advised for future PLAs.

Participants were particularly satisfied with the efficiency and climate of trust that the peer learning method allowed with regard to open and mutual exchange of information. There were no specific complaints or expressions of dissatisfaction with any aspect of the seminar and it was noted that the PLA had been an extremely well organised and most informative one. The different activities were all appreciated as was the social atmosphere that encouraged networking and interaction.

For future PLAs, it is highly recommended to distribute numerous interactive sessions throughout the workshop to create a fresh surge of energy, ideas and different group dynamics. The physical space plays an important role in this context as it can either foster or hinder networking opportunities and the level of participant comfort to discuss and exchange information. The Dublin setting was optimal with participants sitting in an open-square format. Space on the walls allowed for the Gallery Walk panels and Card Collection outcomes to remain visible during the entire workshop. It is also especially important to wisely select participants based on relevant experiences and expertise. The quality of the workshop was also due to the high quality of participants who were very open in their exchange of ideas and knowledge. Nonetheless, this could nonetheless be improved by enclosing with the invitation to the participating countries explicit information on the expected profile of the candidates. In addition, the importance of making participants aware of their role as peer learners should not be underestimated.

5. Conclusions and perspectives

The fourth PLA on early career researchers unveiled the human facet of university research and Europe's objective to become the world's most competitive knowledge economy.

Europe's new generation of researchers face many challenges beyond their academic interests and publishing requirements. Though the current trend is towards employee status offering social security rights and (at least in some cases) competitive salaries, many early career researchers are still considered students and do not benefit from a very elevated status or reputation. Some institutional and national measures are changing this in order to make the researcher career more attractive and to be able to offer better conditions for foreign researchers.

Structured PhD programmes are seen as an important measure for the development of the European Research Area, to attract foreign researchers and to support the development of a knowledge and innovation society. A variety of models for the PhD exist and alternatives are possible. The choice of the best instrument will depend on the system's objectives and should be aligned to them.

The example of Ireland demonstrated the importance and effectiveness of targeted funding instruments to boost researcher conditions and environments. Monitoring of such measures helps governing bodies and funding agencies to respond rapidly and effectively to emerging and existing problems.

Early career researchers also encounter issues concerning open recruitment, career development, skills training, funding, and (international) mobility. The development of mentorship skills, collaboration with industry at all levels of the researcher career and researcher presence in the policy development process are seen as highly important for a robust and sustainable early career researcher system.

Summary Report of Peer Learning Activity 5

Costing of Research Activities: New Funding Models

Murcia, September 2010

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1. Introduction

1.1. Context and challenges

Global shifts

Funding is a key concern for universities worldwide. This topic is particularly relevant as the global economic crisis lingers, affecting the decisions of financial matters concerning higher education and research. Although it is argued that research is an investment important for economies worldwide and a society's ability to be innovative, cuts are still being made - in some countries more dramatically than in others. Maintaining funding levels is crucial for the future development and sustainability of the global knowledge economy, but it can be difficult to convince decision-makers of this while they are pressured to react quickly to improve short-term conditions, sometimes at the sacrifice of long-term vision.

Determining the core funding of universities has traditionally been based on input indicators. However, there is a growing tendency for policymakers to measure performance and base funding on selected performance indicators. Nonetheless, there remain challenges in assessing performance and in finding those indicators which are the most adequate to evaluate success. This largely depends on the national priorities and institutional objectives. It is particularly the case for research which often produces intangible results and externalities.

European context

A core mission of European universities is to promote fundamental and collaborative research. In order to fulfil this mission, HEIs rely on strong funding measures in order to support departments, laboratories, centres, research groups and researchers. Historically, European universities have been largely underfinanced. The ERA Green Paper to the EC Communication "Modernisation Agenda for Universities"[29] underlined the need to reduce the funding gap and make funding work more effectively in education and research. This includes devoting at least 3% of GDP to R&D and 2% of GDP (including both public and private funding) to higher education. Further recommendations include adapting funding to the diversity of institutional profiles and ensuring diversification of research funding portfolios through cooperation with industry, foundations and other private sources.

The ERA was launched a decade ago and has undergone a number of revisions. A key change has been its inclusion as an official formal objective in the treaty of Lisbon and the EU2020 strategy. The Europe 2020 Strategy[30] identifies seven flagship initiatives recently put forth by the European Commission to promote a smart, sustainable and inclusive economy as part of a vision for the 21st century. It is important in providing the opportunity for new instruments, including legal ones, enabling the ERA to move forward and make greater progress. Higher Education, R&D and innovation play important roles in the overall aims of the strategy, described in particular as important for the initiatives 'Innovation Union' and 'Youth on the Move'. The former proposes a number of new measures to be launched in the near future, one of which is access to innovation funding "so as to ensure that innovative ideas can be turned into products and services that create

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[29] EC Communication "Delivering on the Modernisation Agenda for Universities: Education, Research and Innovation" (EC Document, May 2006). Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0208:FIN:EN:PDF

[30] [COM(2010)] 2020 EC Communication "Europe 2020: A European strategy for smart, sustainable and inclusive growth." Brussels, March 2010.

growth and jobs." The initiative 'Youth on the Move' aims to "to enhance the performance of education systems and to facilitate the entry of young people to the labour market" (p.3). The remaining five initiatives also contain key elements concerning industry, skill building, and job growth which overlap with institutional objectives related to education and research aimed at greater European competitiveness. There is a first draft for the FP8 next year which has been formulated to achieve Lisbon aims; part of it also addresses facilitating access to funding.

The full cost model is one recommended approach to increase university competitiveness, strengthen the ERA and EHEA, and improve cost transparency. This is being implemented or is in the process of implementation in a growing number of countries (The Netherlands, Norway, Belgium, UK, Sweden, Ireland, Finland, Austria, etc) and support is increasing at the EU level. The FP7 has played an important role in this development, requiring the use of a full cost model.

1.2. Focus

The proper balance and diversity of funding instruments is necessary to fund university research. In 2009, the OMC CREST Working Group to improve the excellence of research in universities[31] (leading to the follow-up CREST Peer Learning Activities) produced a report recommending a general funding column composed of three elements to ensure stable, basic funding while allowing for cutting-edge research associated with high risk:

- stable, core institutional funding ensuring scientific autonomy and a broad coverage of topics;
- a performance-oriented formula, providing ex-post rewards for good research performance based on agreed objectives;
- an innovation-oriented component to pre-finance new cutting-edge and/or explorative research development.

An important financing reference for policymakers and funders, there are many possibilities of how to create different versions of this model. While realising this model in different ways can provide both flexibility and diversity, for whichever design is chosen, there should be stable basic funding along with consideration of both past performance and future planning.

Three topics were selected for special attention in this PLA:

1. ***Organizing State Systems of Research Funding*** examines how systems choose to balance (or not) their multiple funding streams. This topic includes how components of public research funding are combined in an overall funding system, how systems deal with inconsistencies, different principles of research funding (full cost-orientation, matching funds, selective funding of the best or broad-base funding), and how funding systems take into account the diversity of missions of universities concerning research.

2. ***Full Costing and Transparency***: Full cost funding is recognized as beneficial to institutional autonomy. It allows for internal resource allocation, increases university competitiveness, and improves both accountability/transparency as well as the ability to make strategic decisions.

3. ***Internal Budgeting*** refers to dealing with funding conditions in internal university management. Funding design determines how a university will manage its funds and what

[31] CREST OMC Working Group "Mutual learning on approaches to improve the excellence of research in universities"

kinds of internal problems it will encounter. There is wide diversity in how resources are allocated internally and how research activities supported by allocated funds are recorded. Relevant questions include whether internal allocation systems should copy state funding mechanisms or if they should they set their own priorities and how funding models are put into operational concept on the university level.

To address these topics and more on the costing of research activities and new funding models, peer learning countries explained main obstacles and some features for success. Though national contexts greatly inform resource allocation choices, some key principles were uncovered which could be shared to a greater extent with the larger European university landscape.

2. PLA structure – Working method – Participating countries

Structure

Two workshop days were allotted for this Peer Learning Activity, including a pre-event dinner to make initial contacts and provide a first opportunity for networking. The workshop coincided with the annual regional summer festival, which provided a cultural backdrop for the meeting and insight into the region for the participants. Based on previous PLA experiences, the 2-day workshop length was decided upon as an appropriate workshop length for meaningful networking and exchanges during the peer learning activity sessions.

The morning session of the first day was opened with a welcome address by the Rector of the University of Murcia (Prof. José Antonia Cobacho), followed by the Director General of University Policy (Prof. Juan José Moreno), and the Counsellor of Universities, Enterprises and Research of the Autonomous Community of Murcia (Dr. Salvador Marín). The introduction to the PLA followed with a presentation by the Commission on the topic of costing activities for research funding and the context of the European Research Area. The method and focus of peer learning was summarised by the lead country's representative from Denmark, including the event's expectations in terms of producing best practices, conclusions, key messages as well as new questions and follow up activities. The morning session finished with the first interactive exercise, the Gallery Walk, which provided an opportunity for the group to engage in intensive discussions around five specific questions.

The afternoon session was devoted to the first two topics on costing of research activities. Each topic was organised around an identical format of 15 minute presentations from three or four countries, followed by a question and answer session and a group plenary discussion to identify main issues, lessons learnt and recommendations. The first set of country cases illuminated European examples of organizing systems of state funding of research and the second set dealt with full costing and cost transparency at the state and institutional levels. To end the first day's event, participants were asked to highlight success factors and problems related to research funding systems for the Card Collection activity.

The second day of the PLA opened with results of the Card Collection, linking the discussion points from the previous day. The final round of country presentations ensued, focusing on organizing competitive research funding and managing it from an institutional point of view. The last interactive session was a new element for the PLA workshops. The group was divided into three sub-groups and split into breakout rooms to carry out a peer consulting exercise for three countries. Results were kept within each sub-group though notes were taken in order for the outcomes to be shared in this report. The afternoon session continued with a revisit of the Gallery Walk in order to re-evaluate, add or change statements based on the outcomes over the two days. Additional elements were discussed and added to the relevant categories.

The PLA event ended with a plenary workshop session on lessons learnt from the PLA and the peer learning experience in general. Remarks concerning the peer learning method were positive and several participants noted their enthusiasm in the possibility to share ideas and sort through complex issues with colleagues of similar expertise in other European MS. The moderator then presented his first thoughts on lessons learnt and asked the participants to comment and integrate their own ideas. Lessons learnt include general conclusions and valuable detailed results from country examples and experiences.

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. This mutual learning approach was chosen in the context of applying the Open Method of Coordination to research policy. As the working method for all five CREST PLA events, peer learning offered the opportunity to examine different ways in which national reforms can improve university research performance across Europe. Each event focused on a specific issue, namely, mergers and reforms of the institutional structure of national research systems, world-class excellence in university research, capacity building, recruitment and careers of early-career researchers, and the costing of research activities. The Murcia PLA in Spain was the fifth and final event.

Based on the previous experiences of the previous four PLAs, the interactive tools and the structure of the country presentations had been tested several times, with organisational aspects modified in each PLA to improve upon subsequent PLAs. Some logistical features should be kept in mind for modelling future PLAs, including providing rooms for the event which foster participation and discussion (e.g., round-table format rather than a conference style room) and including interactive exercises early in the programme. In addition, opportunities for networking such as coffee breaks and cultural events should not be underestimated as these times are highly appreciated by participants and often noted as important features of the event. In Murcia, this seemed to work quite well due to the extended lunch breaks and coincidental timing of the region's summer festival.

Regarding presentations, it was still a challenge to find the right balance between giving all countries a chance to share their examples and limiting the overload of information from 10 different contexts. The time limit of 15 minutes plus 5 minutes for questions seemed to be a reasonable compromise. Nonetheless, greater attention must be made to ensuring presentations stay focused on the topic and that background information is provided only in hand-outs.

Lastly, the interactive sessions and small group work stand-out as particular advantages of the PLA events. Participants highlighted these methods as the best way to contribute to the aim of mutual learning and exchange of ideas:

- Gallery Walk: This exercise always proved to be most successful, allowing for the first ideas and discussions to flow as well as creating some initial cohesion of the group.
- Card Collection: This activity gave the chance for each individual to contribute his/her ideas and for group discussions to be stimulated.

- Plenary workshop discussions: These offered a platform for tackling deeper issues and addressing current debates concerning the topic.
- Peer Consulting: This session was added to the schedule due to participant requests for greater interactivity. The exercise provided an additional opportunity for small group work in the form of information exchange and concrete problem solving.

Participating countries
There were ten peer learner countries present at the meeting: Belgium, Denmark (lead country as well as participant), Estonia, Malta, Norway, Poland, Slovenia, Spain (host country), Switzerland and The Netherlands. There was representation from the European Commission as well as IPTS and the three external consultants had moderator and rapporteur roles.

3. Costing of Research Activities

During the welcoming presentations, Dr. Marín of Universities, Enterprises and Research of the Autonomous Community of Murcia highlighted how the region of Murcia had placed a strong focus on the role of research and was working closely with industries and universities in public private partnerships for research. He stressed the importance of working closely with all the stakeholders for the future of the region as well as finding adequate levels of funding and appropriate systems of accountability to ensure results.

The case of host country Spain was presented as moving forward in its university strategy and reform laws, particularly with the *Strategy University 2015*[32] which places universities at the heart of the model for a knowledge-based economy. The strategy is a large social pact between universities, administrations, social and economic agents, and society at large to confront globalization challenges. Special attention was given to the International Campus of Excellence which aims to improve competitiveness of Spanish universities in order to create an international reference, improve quality and excellence, and foster a change in the paradigm of university funding. In addition, Spain was developing a new funding model (its own version of the 3-column financing model) when the economic crisis arose. The challenge for the Spanish HE system is to transform the current economic crisis into an opportunity to accelerate the modernization process and funding of universities, increasing the efficiency and effectiveness of the Spanish University System. The Spanish government has decided that investment in education will be maintained in terms of percentage, but not in terms of the amount, in line with the EU statement from President Barroso.

3.1. Who has to do what to attain financially sustainable university research and to induce excellent research through funding?

In order for research activities to be adequately funded, the calculation of costs is important. Securing financially sustainable university research is necessary for Europe to be able to compete with other countries in producing innovation and strong economic growth. A clear understanding of the roles and responsibilities of the different stakeholders allows for greater awareness of the most salient issues that should be addressed for the most efficient and effective use of funds. More specifically, the Gallery Walk asked the question: who has to do what to attain financially

[32] See: Strategy University 2015: Modernising the University, Government of Spain, Ministry of Education. Madrid, June 2010. http://www.educacion.es/dctm/eu2015/2010-eu2015-ingles.pdf?documentId=0901e72b804260c4

sustainable university research and to induce excellent research through funding? The roles of ministries, funders, institutions, EU and others.

The outcomes of the Gallery Walk are presented in the following table.

Gallery Walk Outcomes

<table>
<tr><th>Stakeholder</th><th>Dos and Don’ts</th></tr>
<tr><td>Ministries</td><td>Provide autonomy
Give more autonomy (all kinds) for universities, including financial.
Do not maintain too much control (no project control and not just top-down policy)
Do not interfere with internal research strategies, but do orientate
Maintain balance
Implement policies which favour stability (long run: 3-4 years) and short economic profit
Combine top-down + bottom-up in the government and in the university strategy
Ensure balance between competitive funding and lump sum funding
Simplify
Simplify financial instruments (simplify requirements, use clear and simple instruments)
Keep in mind KISS (Keep It Small and Simple)
Be aware of funding issues
Do not mix formula based and evaluation based funding models
Do not underestimate the need for baseline funding
Involve the private sector
Give tax incentives (to companies and individuals for donations)
Create incentives for universities to seek third party funding
Other aspects
Base audits on output (evaluation, performance-based funding + core funding)
Provide more and stronger co-operation between universities and the government
Know that no result is still a result
Consider who is taking the risk</td></tr>
<tr><td>Funders</td><td>Provide autonomy
Do not interfere with projects
Give researchers the possibility to define their objectives
Trust researchers
Ensure transparency, simplicity and clear communication
Do not over complicate the process
Ensure clear communication
Develop common principles between funders (nationally/internationally) in applications, reporting, and eligibility of costs, etc.
Ensure transparency of the whole system. Try to avoid too much networking and “good buddies” system
Consider criteria
Identify priorities
Select projects according to criteria
Define criteria according to objectives (though some evaluation can be independent of objectives). Objectives should nonetheless be part of the criteria but there are also other aspects involved.
Formulate clear criteria indicators</td></tr>
</table>

	Ensure proper monitoring and evaluation • Monitor processes and outcomes • Conduct evaluations (ex ante and ex post) • Be clear about the objectives of institutional evaluations (when a the funding body) • Simplify evaluation criteria/indicators *Be aware of important financial issues* • Follow the full cost system: finance, results, budget • Cover overheads (with simple calculations) and indirect costs (if university knows them) or provide a flat rate • Remember that interdisciplinary programmes complement co-financed programmes • Consider the impact of having many projects with sufficient funding and few projects with big funding (spearhead)
Institutions	*Ensure balance* • Ensure balance of cost/quality (definition of parameters & goals of parameters used) • Multiply + diversify funding sources • Give a clear balance to both project and corporate financial management (the corporate management side can be easily overlooked) • Do not try for every funding offer • Do not starve out the local level (instead, ensure that some money is kept at the departmental/local level) *Promote full cost* • Increase awareness of indirect costs • Try to reduce indirect costs → use full cost only (for efficiency, effectiveness & policy measures – Cost Benefit Analysis) • Implement a "Professional" accounting system • Be aware of cultural changes of funding projects (related to full cost idea) *Focus on research* • Conduct good research! • Choose a specialization • Improve research infrastructure *Be coherent and focused* • Do not use different costing principles • Implement & maintain focus on strategies and priorities • Make clear strategic information available for all parties *Have a good HR policy/strategy* • Provide academic freedom vs. professional management • Differentiate between "academics" vs. "researchers" • Diversify wages according to excellence and impact to their field including teaching • Establish selection procedures *Other aspects* • Accept that there is no objective model
EU	*Motivate in a positive way* • Stimulate and motivate full cost accounting (but do not force it) • Stimulate supranational co-operation • Stimulate regional co-operation • Move from control based to trust/results based system *Promote communication, transparency and simplicity* • Simplify, clarify and define application, evaluation and reporting processes over different DGs • Simplify the concept of total costs • Agree on definitions • Give a single interpretation of rules (perhaps through a mediator)

	• Translate general policies into research agendas • Establish the way forward and give a clear indication of what is expected so MS will be on the same wavelength and a comparable basis • Use reasonable approximations • Allow for own/national accounting principles • Do not create too much bureaucracy • Focus on new institutional environments too, not only projects (KISS) • Ensure direct consultation of stakeholders before defining research priorities *Other aspects* • Increase budgets for R&D • Don't over-focus on Europe and under-focus on the regions • Increase importance of ERC • Focus on performance • Evaluate the funding system • Move money from agriculture to science/research
Others (private sector etc)	*Provide funding* • Provide core funding (meaning private funding should perhaps be more important) and supplement public funding • Fund PhD's • Recognise full cost principle • Give endowments • Do not look to the government for funding only/mainly *Support researchers* • Be open to academics in private companies (faculty) • Allow intersectoral mobility and teaching • Employ a few researchers for the long term (marriage) • Share facilities with institutions and other entrepreneurs • Sign clear agreements incl. on expectations, results, publications, etc. • Set up partnerships with win/win situations as start and end points *Be involved in the research agenda* • Contribute to priority setting • Mix university and company researchers within research groups Other aspects • Be aware of the social sciences, too • Be located near institutions/science parks or even inside them • Do not interfere with the results of the research

The moderator toured the gallery with the participants at the end and highlighted some key points emerging from the many animated discussions. Pertinent aspects are summarised in the Lessons Learnt section.

3.2. Country Cases Part 1: Organising systems of state funding of research

Several elements are important for discussion on state systems. The different approaches in organizing systems of state funding of research can be highlighted as follows:

Estonia: Balance between institutional needs and external funding
Malta: Overall system, EU role
Poland: Performance based funding, link to evaluation
Switzerland: Balance basic/competitive funding, introduction of overhead to boost competitive research funding

Country examples and discussion outcomes
Estonia described the structure and impacts of research funding in this very small and dynamic country with a lean government and "e" orientation. An example of a former Soviet country, there is a fast, unstable growth development which does not allow the possibility to fine tune funding aspects. The balance of R&D policy elements is crucial. Funding is largely project competition based (70%). The system strongly motivates quality research and outcomes with most financing sources of an irregular character and almost no specific infrastructure related costs (no depreciation, no specific maintenance). This highlights a number of problems in the research funding structure:

- A dominantly externally funded system means less autonomy and less strategic decision making by the institution and may also hinder infrastructural development.
- Funding is not responding enough to other missions of research.
- A strictly past performance and competition-based funding does not support development of new research areas and is not conducive to "risky" research projects.
- Different project management and costing practices generate administrative burden.

In conclusion, Estonian strategic choices to stimulate competition and performance have been successful, though adjustments in funding structure and principles are needed. Estonia is currently preparing a reform in research funding which is aimed to adjust the funding system and funding bodies towards a better balance of institutional needs.

In *Malta*, there are diverse funding streams for the University of Malta. Total funding for universities from the government has increased since 2007 (by 49%) and research funding has increased by 100%. A Trust Fund has been set up in 2010 with €500K to encourage research for commercial and industrial purposes. The national R&I programme has €700K in 2010 and is for applied research through collaboration between academic and industry or public entities in order to encourage broadening of financial resources. Funding is on a competitive basis through an open call for four priority areas in the National Plan. There is a step towards broadening the financial resources of the University and Malta intends to adopt a full cost system, though it is still at the discussion stage. On the EU FP7 level, there is improved participation rate but it is still relatively low (16% success rate). There is a need to better incentivise university researchers to apply for and participate in FP funding.

Poland is in a state of transition and presented the role of evaluation in determining criteria for funding purposes and the challenge associated with its design. The country has a performance-based institutional funding model which is under pressure for change. The institutional evaluation is carried out with respect to scientific activity results and to practical applications of scientific research results and development work. Changes are being made in the system in line with international standards and to better serve the objectives of government policy. A new evaluation body has been set up along with new categories and criteria for institutional evaluation. The outcome of the evaluation of the categories will determine funding (but categories will also be used for other ways). The effort to find appropriate criteria was not the (sole) work of the Ministry but a compromise between different interest groups and stakeholders. A consultation survey has been carried out and the outcomes integrated into the system. Details of the new system and the change process are presented in the PowerPoint presentation.

Switzerland presented the public funding of research activities, including the mechanisms of institutional funding and competitive funding. Regarding the sustainable public funding of research activities at public universities, research funding agencies such as the Swiss National

Science Foundation (SNSF) assume that applicants provide for basic infrastructure and financing of indirect costs. As a consequence, successful researchers who secure third party funds tie institutional funds of their home university. The introduction of overheads in 2009 shall boost competitive research funding and promote research activities at public universities in the long term. In competitive funding mechanisms, the amendment of the Federal Act on Research allows for funding of indirect costs to be treated as a specific instrument for research promotion. The compensation rate for indirect research costs is maximum 20% of the grant and is paid out directly to the institutions which can dispose freely of the money. Challenges lie in the limited growth of public funds (compared to the years 2008-2011) for education and research. There is a conflict of goals between competitive research funding versus institutional funding of universities (ETH domain; Cantonal universities) and the funding of research projects (direct costs) versus funding of overhead (indirect costs).

Discussion:
All presentations linked funding and performance though a number of questions and observations were noted by participants:

Sustainability, selectivity and excellence

- How selective should the system be? The *UK* is extremely selective and focuses on the very top, or is it possible to have a broader base but still be selective?
- How do you guarantee sustainability of the system without sustaining poor performance? Selection is part of it.
- What is the driver to increase funding: to increase the level of excellence or to make universities sustainable?
- Only good quality research deserves to be sustainable, but how far should this approach be taken? Some measures need to be implemented in order to distribute the majority of resources towards good quality.
- There are many ways to conduct good quality research. There is not just one route to compete with the top universities in the world. Good research can also be produced at the regional level without competing at the global level.
- If there is only an increase in the amount universities receive for competitive funding, there may be an effect whereby the more successful a university is now, the more successful it will be in the future, creating a situation where there are poles of excellence but the remaining universities in the country are neglected.

Assessment and performance

- If there is competitive funding, how much ex post performance measurement should there be? Should results or should future plans be funded and what is the relationship between the two?
- It is important to distinguish performance based (based on output, distribution according to parameters) and competitive funding.
- Context plays a major part. *Poland*'s post-Communist status calls for objective indicators, rather than soft, opinion-based assessment.
- *Estonia* sees how indicators are changing behaviours of scientists – filing patents, co-authorship, etc.
- If indicators are linked to funding, scientists will deviate in behaviour or game results to garner more resources.

- o If evaluation is linked to funding, people will not reveal their weaknesses. It is better to try to gain results instead through peer review *and* indicators.

Promoting risky research

- o How is it best to promote new, risky, or unconventional research? Large baseline funding (with some performance indicators and competitive based) to promote new projects may be one option (as in *Norway*), though for the national governments, it can be a problem of how to distribute the funding towards risky research inside universities. Civil service tenure is less likely to produce new research, though this works in *Denmark* where they can offer 5 year tenures, which is ideal for new projects. Specific funding schemes are risky but if they work, there are real impacts and they give the signal that failure is allowed.

3.3. Country cases part 2: Full costing and cost transparency at the state and institutional levels

Presentations fit nicely together and looked at the full costing issue from three different perspectives (institutional, governmental and framework conditions).

The key points highlighted in the presentations were as follows:

Belgium	Full costing, indirect costs
Netherlands	Transparency in funding systems
Norway	Full cost model, calculation of indirect costs

Country examples and discussion outcomes

In *Belgium*, funding of indirect costs of research is based on the additional costs of projects, with strong differences between funding agencies. Financial sustainability is greatly affected since "every research project is loss making" and is supported by other resources which should be for education or infrastructure. Consequently, there are fewer resources for expansion, investment, and renovation, which could lead to less research in the future. A solution could be to switch from the additional cost to the full cost model, but it is hard to persuade national/local governments to increase research in the context of a worldwide economic crisis. However, scheduled changes in EU funding principles might serve as pioneer. The European Framework Programme recognises the purpose of full costing and is the real motivator for universities to move towards full costing, though incentives are needed. Under the EC, there is a simplification proposal whereby actual costs according to accounting principles are eligible and enable the beneficiary to select the cost model that corresponds to one's own reality. It applies to national funding as well. For finance experts, full costing is necessary to sustain research. The benefits of such a model would include transparent and audited costing as well as nation-wide referencing. The impact of full costing for funders is that only financially sustainable projects will be accepted. Without a budget increase, basic research will be impacted, with less projects at higher cost.

In *The Netherlands*, funding streams include the largest contribution from the government (formula based, according to students, historical). This lump sum money of 65% is education money which can be used for research or infrastructure. Universities are financially autonomous and can spend money according to their own priorities. A reform is under development to introduce more transparency using a full cost system to distribute research money and to develop more awareness about costs that will inform financial decisions. A series of negotiation rounds have produced agreements on the standard framework for government, subsidies, and clear funding rules. It is important to explain to the government the full cost of doing research and to bring consciousness of full costs to all stakeholders. Strengths of the new system are better management, better negotiation, less red tape, and improved cooperation and willingness to invest in research and higher education by funders. Weaknesses are high initial costs, administrative investments, and time lag between investment and results. A major lesson has been the awareness of the costing system by stakeholders which is an important requirement for successful negotiations.

Norway presented a model for the calculation of indirect costs in externally funded research projects. Focusing on actual costs in research projects is a European trend. All relevant/eligible costs, all direct costs (not only project staff but university staff) and actual indirect costs (not standard rate) are calculated. Financing (European, 75% and Norwegian, 5-30%) is a part of total costs and according to Norwegian regulations, budgeting and accounting must display all costs (due to a growing importance of externally funded research projects). A report was produced on 19 April 2010[33] by a working group with representatives from all seven Norwegian universities on reporting of actual indirect costs in EU funded research projects. The volume of indirect costs is related to time spent by scientific personnel, based on official accounts and related to organisational structures (university costs are attributed evenly while departmental costs will vary). The benefits are that all costs are accounted for and when resources are limited, all use of resources should be known. It also provides clear information for priority discussions. There is national agreement so there is no competition on the basis of inadequate calculation, only on scientific competence.

Discussion:

Understanding full costing

There is a need for a common understanding about full costs, indirect/direct costs and about calculating costs. Understanding full costs does not increase costs, but enables better decisions. In *The Netherlands*, for example, they are seeking real calculation of costs and are looking for simplification. In *Norway*, they use a calculation system and in *Belgium*, a simplification process is proposed. Having a calculation process and simplification would be best rather than heavy use of detailed accounting (substituting detailed time sheets with a *reasonable approximation* and not "as close as possible" because this demands an exact understanding of full costs). The *Norwegian* system provides a good example of calculating costs, based on a professor writing the percentage of time spent on activities (twice a year) rather than detailed time sheets.

Stimulating full costing

Regarding *The Netherlands*, the question was raised as to how to stimulate universities to move towards full costing. The University of Amsterdam implemented full costing in four years with three people. The government should subsidize programmes where universities work together and funds should be allocated to change the system. Ultimately, though, it is the responsibility of the university to choose the system. The full cost system in University A can be different than that of University B.

Finding a common terminology

There is an international standard definition of accounting. This needs to be made aware to countries. At the EU level, providing training could help to ensure a common terminology.

[33] English version soon available.

3.4. Country cases part 3: Organizing competitive research funding and managing it from an institutional point of view

The third topic for this PLA concerned organizing and managing competitive research funding.

The focus of each country was the following:

Denmark: Balance between quality research and setting institutional strategies
Slovenia: Internal effects of funding mechanisms; how to manage competitive funding
Spain: Mixture of state and institutional, national and regional funding, EU role

Country examples and discussion outcomes

In *Denmark,* universities are heavily state financed (app.90%) with private funds slightly increasing. The country currently has a performance based system for education and basic grant funding for research, though there is a trend towards an even more performance-based system. Basic grants make up the largest portion of public research, followed by competitive research funding and other sources. Universities are free to choose how they spend the funds received from basic grants for research. There are stable or increasing state funds despite the economic crisis and the balance between basic and competitive grants has been steady (60%/40%). The government is trying to create some sort of matching system for private funds to match public funds.[34]

The institutional view was also presented with the case of the University of Copenhagen. Education funding and basic research grants are distributed at the central level with indirect costs removed at that level. A smaller amount then goes to faculties, which again remove indirect costs, so there is even less for the institutes, which also take out their indirect costs. External funding is given at the institute level. Due to high education costs, there is substantial co-financing of education with basic research funding. Research projects have indirect costs of approximately 60% and are consequently underfunded. External funding is gaining importance, but is not representative of all faculties.

Slovenia presented challenges for university management and its efforts in trying to give more autonomy to institutions. Funding distribution is currently based on a set of indicators and looks at programme/project groups or researchers and considers past performance over 5 years. Funding for education is a lump sum while research funding is based on research hour price. Universities submit monthly reports on hours of research to receive funding. A new system is planned with a lump sum for teaching plus a strategic fund for research with lump sum, competitive research funds, funds for equipment and other non public sources. A number of challenges are being addressed, including how to build an HE information and monitoring system, how to monitor the efficiency of HEIs and the research system, how to determine and distribute lump sums for research, how to build trust and give control to universities (as well as internal trust within the universities), and how to determine the minimum quality to be achieved, as well as who should set the norms and standards.

[34] The Danish system was based on the Norwegian results-based redistribution model. A description of this model can be found in the CREST OMC Working Group report on mutual learning approaches to improve the excellence of research in universities, (which led to this peer learning follow-up activity). See page 83 of the CREST OMC Working Group report on mutual learning approaches to improve the excellence of research in universities, March 2009. European Commission, Brussels. http://ec.europa.eu/invest-in-research/pdf/download_en/175625_crest_4th_omc_working_group.pdf

In *Spain*, changes are taking place. The system is very regionally-oriented, but the overhead is fixed by the national government. There has been significant increase in research funding in recent years but it is not known what the effects of the crisis will be. Spain's challenge is to become more competitive and align its levels with the EU by 2011. To achieve these aims of convergence, the Government has introduced the INGENIO 2010 programme which allocates more resources to R&D&I. It is promoting legislative reform to encourage R&D&I activities and is implementing a new system to monitor and evaluate policies. Spanish universities are often less motivated to apply for EU funding because of access to national funding; however, this translates to missed opportunities for participation in international networks. There needs to be an active role of management to encourage EU applications.

There are a number of other challenges to be addressed:

- How to ensure the financial sustainability of research and competitive research.
- How to evaluate teaching overload and implement Bologna.
- How to deal with (sometimes unmotivated) researchers on tenure who have no need for new funding.
- How to obtain more EU funding: overcoming the language barrier and a lack of time.
- How to deal with the culture of research transfer to companies and patenting issues.
- How to foster an entrepreneurial culture.

3.5. Peer Consulting

Three special cases from Estonia, Poland and Spain were discussed in groups of 5-6 participants in the context of the peer consulting exercise. The results from each group are summarised in the following section.

Peer consulting 1 - Poland

The problem for Poland was identified as the following: *How to introduce indicators that allow for differentiation among the disciplines in order to improve the assessment exercise for both the purposes of funding and improvement?*

The group provided insight on how to create a funding system for research based on output.
It considered models such as formula based (as in Norway) and evaluation based (UK system) and opted for the formula based model. It pointed out that formula based systems do not evaluate quality directly but quality is encouraged through other means. It also has the advantage that it is simple even if it is not always fair. The group rejected a mixed model since it does not provide transparency and stressed the need to have small numbers of indicators since too many may create contradictions.

Further recommendations were offered:

- To implement a national evaluation of research every 5-8 years but not to use it in the funding model immediately.
- To have an international review (e.g., the OECD which is expensive but very helpful) with some national input to find out where there is excellence according to international standards. The same should be done for the educational aspect to find out if there is the right balance. This should be for information and not funding purposes in the early stages although there could be extra funds made available based on the evaluation.

- To employ different funding models for different sectors based on specific objectives and to create (few) categories, avoiding over-complication.
- To introduce the model slowly in order to avoid problems (Denmark introduced only 2% in the first stage).
- To keep the model simple and transparent with as little bureaucracy as possible so that it is easily understandable down to individual researchers. It is inevitable that there will be some unfairness and that has to be accepted. The group also pointed out that there may be legal obstacles to be overcome and warned that resistance would be strong at the start.

Peer Consulting 2 - Spain

The problem for Spain was identified as the following: *How to control expenditure of projects as people do not pay attention to the types of payments they need to make.*

A number of proposals were given by the group to address the issues raised by the Spanish representative:

- Introduce a control system of time and costs of work in the project.
- Implement an active human resource management and strategy.
- Require staff at universities to do both education and research and combine the salaries for both. Provide incentives to conduct research for those professors whose main focus is to teach.
- Model how to divide the money internally (for example, offer incentives of 100 EUR per article).
- Introduce an internal monitoring and evaluation system of professors for both teaching and research. Conduct evaluations of staff members with their superior to determine what they have developed.
- Set up a project management group that takes over the EU administration and specialises in EU subsidies.
- Regarding research groups:
    - Distinguish between active and inactive research groups.
    - A research group should be active; otherwise, they lose status.
    - There should be objectives and expectations of what is expected of a group in advance.
    - Interventions should be foreseen in case of inactive research groups.
    - There should be incentives for good research groups.

Peer consulting 3 – Estonia

Estonia presented three specific issues inherent to the Estonia HE system:

- *How to deal with autonomy related questions in a predominantly externally funding environment.* Estonia is unable to fine tune the funding system due to fast growth and external funds. Estonian universities do not have the strategic means to make strategic internal decisions because funding is external.
- *How to counter balance the tendency to select safer, securer research to competition/performance based financing.*
- *How to find the proper balance of funding infrastructure*. There is no mechanism to determine the proper allocation for infrastructure costs and it is not known how to allocate money to run labs, for example.

Estonia noted the most interesting outcomes for their situation based on the group's proposals and expressed satisfaction in hearing possible solutions and further areas to explore. The points below have potential to address some of the HE system's issues:

- Typically, bigger lump sum would be the basis for having riskier projects. However, this is not necessarily so if the lump sum is being used to be more competitive (as in Estonia). In the strategy, if all the money is coming from external sources, this leaves no room for the university to follow its own strategy line.
- Moving from external funding to lump sum and co-funding is suggested. An improvement would be a total cost approach as a concept of simplification to know what the costs are in certain fields.
- It is advised to establish costs and then move in the direction where universities prove that they are capable of making strategic choices. If universities do not have more lump sum money, they do not have the opportunity to show it.
- There are no clear references to golden rules to proportions, but practices, such as the research institutes example in Switzerland or the Danish example of 40/60% funding are worth noting.
- In regards to infrastructure: institutional government funding could allow for maintaining infrastructure or developing or raising the overhead rates. This could be in the form of expansion in co-funding.
- Promoting risk could also be achieved by designing the appropriate conditions (such as the Danish examples of their Centres of Excellence or UNIK).
- A noteworthy idea is to fund research centres based on academics' potential instead of projects (people instead of projects).
- Finding a way to finance some academic freelancers who are properly selected (short-listed from the ERC, for example) as a potential target group (young as well as established scientists) could promote more risk in research projects. Allowing them to freely conduct research without (too much) monitoring would be necessary.
- A recommendation is to make room for promising researchers who have not yet reached the level of high notoriety. If competitive money is too large a portion, there will be success for some years, but then a decline. It is important to have money to invest in future excellence which is not excellent yet.
- Promoting inter-disciplinarism (such as in The Netherlands) could be a very interesting way to foster riskier and more innovative research, fitting well in the Estonian context.

3.6. Lessons Learnt on Costing of Research Activities: New Funding Models

Lessons learnt on the costing of research activities included country conclusions, general conclusions from comparisons, and discussion outcomes from the Gallery Walk, Card Collection and Plenary Workshop activities. These findings can be grouped into four basic categories:

1. General conclusions
2. State Systems of Research Funding
3. Full Costing and Transparency
4. Internal Budgeting

1. General conclusions

Based on the country examples, group discussions and interactive exercises, a number of core elements were identified which are needed for a good research funding system: promote the **full-cost model (but do not use it as a political steering mechanism)**, ensure **coherence** of system elements, create **balance** of system objectives, foster **communication** at all levels, agree upon **common definitions** for costing principles, **simplify and harmonize** regulations, **reduce bureaucracy** (make exceptions for project funding), promote **transparency**, respect the **diverse missions** of HEIs, reward **performance**, ensure financial **sustainability**, enable new developments and **risk**, stimulate institutional **strategic priorities**, enhance **private funding**, and provide institutional **autonomy** (financial, academic, organizational, and in terms of human resources). Further explanation of these aspects is provided in the recommendations for state systems of research funding, full costing and transparency, and internal budgeting.

Governments (ministries), funders, institutions, the EU, and the private sector are responsible for ensuring these elements are successfully integrated into a research funding system. These stakeholders play important decision-making roles in attaining financially sustainable university research and in inducing excellent research through funding.

The importance of EU funding and support for MS is clear, but there are also several issues to be improved upon:

The EU should engage in direct consultation of stakeholders before defining priorities, moving from a control based to a more trust/results based system. Regarding their role **in promoting full cost** accounting, they should motivate in a positive way, **stimulating this model through incentives**, but avoid forcing its adoption. The varying application **procedures and programme regulations should be simplified and harmonized** between the different Directorate-Generals. Furthermore, **there should be greater flexibility in accounting** according to national systems and a consideration of exceptions for research in financial rules (in terms of auditing, for example). The EU should also **stimulate cooperation between regions.**

2. Organizing state systems of research funding

There are certain key factors for the success of state systems funding research, such as balance in the policy mix, providing appropriate framework conditions, and promoting a strategic orientation of funding models. More detailed recommendations are described below.

<u>Balance and Autonomy</u>

1. **The magic word for the design of systems is "balance." Criteria are needed to evaluate and come closer to what the right balance is**, though there is no obvious measure to determine exactly what that proper balance should be. An essential criterion is that there must be different elements in the policy mix and funding systems. The country context and national strategy need to be considered as there is no "one size fits all" funding model.

2. **An approach which includes three basic elements is a reasonable, general orientation for state funding models (stable core funding portion, performance-oriented funding portion, future-oriented funding portion).** This mix balances different objectives, especially the potential tension between a performance orientation and one of sustainability.

3. **For the success of state systems funding research, financial and strategic autonomy must be granted to universities, including budget freedom and allowing room for risk.** There must be enough core funding to co-finance projects and for the universities to make their

own decisions. Rather than micro-funding, funding should be concentrated on major projects with support for a sufficient amount of high quality research projects.

Risk and Diversity

4. **Risk should be an element in designing funding models and funding instruments should be designed in a way to promote risk.** New ideas emerge in a field with young researchers, so opportunities must be created for this to be developed. **Systemic elements which promote risky innovation and which should be considered in future funding models include a culture that allows for failure, special programmes targeting risky projects** (sponsored by the ERC, foundations, etc.), **flexibilities** such as a mix of programmes with different objectives helping to create different opportunities, **a clear end of support** (time limits) for research excellence projects in order to create potential for new initiatives, and the promotion of **interdisciplinarity**. **Large base-line funding** (with some performance indicators and competitive based) **is also recommended to promote new, risky, or unconventional research**. This could be a task for the European Research Council, since national councils are afraid to take risks.

5. **Regarding research groups and topics, there should be diversity between fields of research and groups of researchers (different ages).** Though research groups need to be able to adapt to new tendencies and fixation on one research field can be problematic (inflexibility), it is important to establish priority areas of research (specialization).

Performance and Measurement

6. **To characterise different models of performance orientation, the aspects of ex ante (future) versus ex post (past) performance rewards and indicators versus peer review need to be considered.** Instruments employed in different European countries could be put in a matrix to maximize comparisons and uncover good practices.

7. **Indicator-based funding should include indicators taking into account different institutional missions and specialties of disciplines**. This is a difficult task but should be strived for as disciplines are more willing to accept performance measurements if they recognize elements of their own culture in the indicators. A simple formula could be an element, but it is not enough to inform complex funding strategies.

8. **Only good research quality deserves to be sustained; therefore, core funding also has to be monitored** (though not annually in order to avoid micro-managing). This carries with it the challenge in defining ‘good’ research or what timeframe ‘sustainable’ refers to. For this, **clearer concepts and ways to determine the selectivity of mechanisms should be developed.**

9. **Excessive control or interventions by national governments should be avoided.** Rather than interference, orientation should be provided with the use of simplified instruments to **focus on performance and results**. This focus on performance (including competitive funding) as well as on **establishing appropriate output indictors for monitoring and measurement purposes** is important for the success of research funding. This especially important considering potential changes in political priorities.

Transparency, simplicity and communication

10. **Transparency promoting clear rules and simple, well-defined objectives in funding criteria and mechanisms is crucial for state systems and must be integrated within these systems. Common agreements about clear funding definitions must be established across Europe.**

11. **A service providing systematic information on research funding opportunities is needed.** In addition, different conditions, requirements, and accounting principles from different funders create administrative burden. **These must be simplified and better communicated to researchers.**

12. **In general, careful consideration must be made for efficient and effective communication at all levels.** An awareness of the timeframe involved for funding measures is also important, keeping in mind that results are often observed well after the measures were implemented.

Strategy

13. **It is recommended that funders define objectives and provide funding for specific projects (using different instruments) to guarantee greater access, with selection made through transparent processes and according to the criteria.** As there are often different objectives between funders and universities and challenges in fitting research lines with the demands of funding agencies, **increased coordination and communication is important**. This is also important when funding conditions do not correspond to researcher needs (such as a requirement to have X partners in a project, etc). All target groups should somehow have the chance to attract funding. Large projects with substantial funding can be supported, but funds must also be available to support individual researchers and small groups with good ideas.

14. **Strategic foresight (including the right mix of short term and long term policies) is needed to ensure the successful management of research funding.** Long term vision and clear national priorities (a specialization, a focus on quality, and risk and assessment results) should be a part of this foresight.

15. **Efforts should be made to involve the private sector (industry, foundations, etc.) in creating and maintaining a successful research funding system.** The private sector can contribute by providing and supplementing core and public funding, supporting/hiring researchers, promoting collaboration with institutions and research groups, etc., and having clear agreements with researchers, avoiding interfering with research results.

3. Full costing and transparency

Costing is a salient issue for the success of research funding. Sometimes poorly interpreted, it is important to understand costs and to be aware of different costing positions (i.e., different perspectives of shareholders). Policy messages and recommendations on full costing and transparency are provided in the following section.

1. **Full cost should be used as a basis for calculation and when possible, external competitive funding should employ the full cost model. Full costing does not increase real costs but enables better choices and is worthwhile even if the full cost is not funded.**

Real full cost models can become extremely complex if full cost means the actual cost of each individual project. Rather, approximate simple full cost based on a flat rate model. Whether the indirect costs of a research project at 52% or 54% is not important; the first 50% is important.

2. **Full costing as an instrument often focuses on creating a workable funding system; however, it could and should have more functions**, such as stimulating communication, motivating cost reduction, strengthening the political position of universities (funding biases become transparent), clarifying co-financing relations, providing a basis for priority discussions, and bringing about consciousness (which could lead to more rational decision-making).

3. **Full costing has to adapt to national situations. In whatever the context, consistency must be created in the system. It is also important to recognise full cost in all parts of the university.** In addition, discussions with the private sector need to occur before implementation of full costing as this model does not always align with how they operate.

4. **As the definition of indirect costs varies across countries, the meaning should be clear (mostly meaning fixed costs) and set at the European level.** The process must be linked with communication. Making clear the purpose of cost accounting and using the appropriate methods referring to the purpose is one step, but using accounting expertise is not the (sole) way to eliminate confusion. The differences in accounting and reporting principles can create misunderstanding and errors. Coming to a common understanding through dialogue between stakeholders could contribute to greater harmony in the understanding of direct/indirect costs.

5. **Pragmatic models are needed to calculate direct and indirect project costs in order to give a clear orientation by funders.** Considering reasonable proxies instead of being "as close as possible" to real costs is suggested. A good example for reasonable proxies is a pragmatic use of time sheets for researchers. Rather than a detailed recording of time which does not match the total costs approach, time sheet systems should be replaced with simpler recording methods such as calculating percentages for staff in different projects, twice a year. In the calculations, uncertainly should be described, such as how large the error could be.

6. **In terms of costing, it is important to implement cost control (including funding and payment).** Proper costs should be allocated (researchers are not always aware of the kind of cost that creates a problem during justification).

7. **Cost-benefit analysis is difficult but necessary. Cost accounting alone is not advised, as the beneficial aspects should also be integrated.** However, it is difficult to calculate what is beneficial (quality, etc.) in monetary terms. This is more complex than in industry because results and intangibles cannot be valorized.

Internal budgeting

There are certain obstacles or major problems in dealing internally with external research funding systems. No funding system is objective and carries with it specific issues. Some of the most pertinent challenges are noted below along with possible recommendations.

1. **Good communication is of utmost importance, particularly *within* the university.** Since it is not possible to carry out all that is desired (such as being the best in both education and research), there is a need to make choices and provide the opportunity for discussions about priorities.

2. **Strong management is imperative for the success of research funding system.** Management should play an active role in setting strategic research priorities, allowing for internal allocation of overheads, creating a culture of cross subsidisation, giving strong support for research groups, providing full cost funding, obtaining more EU funding, and providing centralized administrative support for applications.

3. **In institutions, there is a need to implement a cost-benefit analysis, but to also try to ensure the best quality possible. HEIs should develop tools for greater efficiency and multiply and diversify funding sources.**

4. **Using internal resource allocation, budgets should be given directly to research groups but there should also be central funds at the rector level.** A well-balanced budget is mandatory. Decisions should be well-argued, based on the pros and cons of the alternatives, and informed by what works best in that context. Substantial decentralized financial flexibility should be given to meet the research needs of the group and the budget should allow for the development of strategic priorities/investment. When there are external mechanisms (such as the Excellence Initiative), rectors should avoid the temptation to take funds to the central level as there is a resulting uncertainty of how monies are distributed.

5. **A way to deal with central / decentral overhead costs is needed as there is no general solution regarding to which internal level overheads should be attributed. Certain actions can be helpful, such as creating central discretion and creating decentral flexibility (to give incentives).** The choice of which level these costs are distributed depends on where the cost is charged (e.g., for labs) and on the concept of the cost centre. There are probably many models for this and these need to be collected and analysed to find good practices.

4. Evaluation of PLA methods

This fifth PLA was the culmination of a series of interactive peer learning workshops held across Europe throughout 2010. As the final PLA, it proved to be a dynamic and enriching exchange with very high satisfaction of both participants and organizers. It confirmed the success of the PLA method and workshop model as has been improved upon since the first PLA. There was unanimous feeling that the method of peer learning was worthwhile in the context of the topic in order to share and receive information from colleagues, with all participants assessing it as either extremely or very useful.

Overall, participants rated the learning effects of the different workshop formats above average with several statements concerning appreciation for the interactive nature of the seminar and the opportunity to take part in the different activities, especially the Gallery Walk. The Peer Consulting exercise which was introduced for the first time also received a high score and impressions from the group were overall positive. Nonetheless, some improvements could be made in the preparation phase to ensure clear expectations and the best use of time. Experiences depended on the sub-groups, but including a stricter format for presenters to follow to quickly identify the core problem or challenge would be helpful. As in all small group work, the group dynamics and levels of expertise on the topic played a large role in how discussions evolved. It was noted that there were similar problems across countries and it was interesting to follow the fantasy of coming up with solutions.

Participants were particularly satisfied with the efficiency and climate of trust that the peer learning method allowed, the opportunity to participate in discussions that were well moderated, and the overall organisation of the seminar. This can be attributed partly to the progressive fine-tuning of the event by the organisers over the five PLAs, but was also influenced by the quality of the participants themselves who were very active in their exchange of ideas and knowledge and worked well as a group. People enjoyed the social atmosphere, noting the combination of informality and efficiency as effective and hoped that the PLA methodology would be used in the future. One participant noted the idea of the PLA as “quite inspiring” since they do not have the experience to share in their own country because lobbying occurs when topics are discussed nationally.

Major improvements noted by the participants concerned the provision of information prior to the event and more time for discussion by shortening presentations. Having ten country cases can be perceived as overload by some participants, but for varied discussions and comparisons, this is an important feature of the PLA design. One option may be to more specifically address the challenges to be discussed and arrive at the main issue faster. As country problems can dissolve into a presentation and comparisons can be difficult, it would perhaps be easier to adopt a similar pattern for presentations or a choice of templates.

For improved peer learning, it is important to have a better grouping of levels of expertise and backgrounds with similar problems, challenges and targets. For this PLA, the mix was excellent, but this was not always the case in previous PLAs. A right balance of countries is also relevant for a variety of views and issues but it is more important to have a good concept of mixing levels and participants (rather than the countries). There should be a method for proper selection of participants. However, it may not be necessary to design the group too purposefully as accidental exchange is in some ways part of the process.

5. Conclusions and perspectives

The fifth PLA on costing of research activities focused on how to best ensure an efficient use of scare research funds while maintaining European university sustainability. Participants identified important features for the success of funding schemes. These include providing autonomy to universities (financial and other) and ensuring a proper balance in the funding design model and in approaches to costing of research activities. Despite there being no “golden rule” for determining exact proportions of basic grants, competitive or performance funds and funding for cutting-edge research, elements of all three are important to ensure a stable, sustainable system which also allows for innovative future developments. Host country Spain provided an example of this as a basis for their new funding model. Strategic orientation of funding models (having foresight and long term vision, supporting major projects, and providing room for risk) and framework conditions (ensuring proper budgeting, supporting research groups, and promoting diversification) are also necessary to provide optimal conditions for success.

In addition, focusing on performance and output when creating new funding models would help to promote a more competitive, results-oriented HE landscape. Financial support must be available for new developments in research fields or good ideas from an active research group. Funding people rather than projects is also a recommended approach and this should include a mix of early career and established scientists in order to promote both basic and riskier research.

It was also apparent that EU funding and simplification (of processes, rules and requirements, etc.) are important for all countries. Promoting transparency, adopting a standard accounting system, simplifying calculations, and streamlining funding applications are concrete measures to be taken towards this aim. A need to decide upon common terminology and standard definitions in costing was also stressed as a way to facilitate processes and communication. The EU can also play a role in creating awareness about real costs and in providing incentives for universities to move towards full cost funding. Peer learning countries presented various paths towards this European trend. The design of full cost models vary across Europe and countries are at different stages of discussion, development and implementation. Stimulating full costing in a positive way would likely encourage further developments in this direction.

Despite the current climate of economic difficulty, many governments remain committed to maintaining (and in some cases, increasing) funding for research activities, aligning with EU recommendations. However, this is not the case everywhere and the importance of co-funding and finding external financial support is increasing.

In conclusion, the costing of research activities is highly relevant for Europe's objective to become the world's most competitive knowledge economy. Though countries face many challenges, current trends show that there are developments towards full costing, finding funding balance, providing financial autonomy, seeking third party funding, supporting riskier and innovative research and emphasizing the importance of funding people.