PERIODICAL EVALUATION AND FUNDING OF FCT R&D UNITS

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Review Panels Stage 2 - Final Meeting Guidelines

19/11/2014

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Evaluation Structure - Panels

Given the distribution of the scientific domains covered by the **178 applications** that qualified for stage 2, six **disciplinary** and one **multidisciplinary** review panels are set up. In addition of the Chair, each panel is composed of 6 to 14 members depending on the number of research plans to be considered.

- Panel 01: Exact Sciences;
- Panel 02: Engineering Sciences;
- Panel 03: Health and Life Sciences;
- Panel 04: Natural and Environmental Sciences;
- Panel 05: Social Sciences;
- Panel 06: Humanities;
- *Panel 07: Multidisciplinary.*

Panel 07 is constituted by members from the different six disciplinary panels. This panel is in charge of assessing the applications that have been submitted and identified as cutting across research domains of several panels.

Inputs

During the final consensus discussion, the Panels should take into consideration the following inputs in order to reach a final classification for the units:

1) The unit's applications, which are organised around the following two major elements which should be taken into account (as relevant) when addressing each of the assessment criteria:
- The scientific and technological activities undertaken since the last periodic evaluation (2008-2012) (performance indicators);
- The research strategies and planned work for the next six years (2015-2020), consolidated as a strategic programme.

2) The bibliometric analysis provided by Elsevier (based on Scopus database).

3) The Stage 1 consensus reports, produced by the evaluation panels following the first plenary meeting, in May 2014

4) The appeal provided by the unit (if applicable) and the panel's answer to the appeal.

5) The Site Visits Reports, produced by the panel members that visited the units between July and November 2014.

In addition, the following should also be considered:

6) The **Smart Specialisation Strategy for Portugal (2014-2020)**, which presents the 15 national priority themes and a matrix with the alignment of national priorities with the ones at regional level (please refer to annex 2). This will serve to verify if a given unit is eligible for funding through the EU structural funds.

Please note that this is not an evaluation criterion and does not impact on the final classification of the unit.

Review Panel meetings (November 2014) - Aims

After the completion of all the site visits, the review panels will reconvene in order to integrate the outcomes and findings of the visits (final review panel meeting). The starting points for discussions are the stage 1 evaluations and the site visits reports.

The aim of the meetings will be to assess all stage 2 applications, taking into account the above elements, and agreeing on a final classification for each unit.

Potential conflicts of interest: In addition to the initial verifications made by ESF and FCT, at the final meeting discussions on each unit, panel members must notify to the panel ALL contacts or connections they may have had with the unit or its staff in the course of the last five years or any planned upcoming collaborations. This may involve reiterating declarations already made, but there may have been new contacts in the last few months, and it will in any case be appropriate to reconsider those already notified. The panel will then be able to take a view on each case.

Evaluation criteria stage 2

Scientific merit and excellence, by international standards, are the main criteria used to assess and to classify the units. These criteria apply to the past and future planned research activities as well as to the Research Unit's team. During stage 2, the evaluation is based on the following **five criteria**:

Criterion A. Productivity and contribution to the National Scientific and Technological System (NSTS)

i.) Research outputs; knowledge and technology transfer activities, when applicable, giving particular importance to the registration and value of patents, models or other relevant innovation indicators;

ii.) Contribution to the accumulation of knowledge and skills of the National Science and Technology System (expected effects and results); contribution to the advanced training of researchers; contribution to the promotion and dissemination of scientific and technological research; dissemination of results and actions to promote scientific culture, as well as participation in activities designed to promote public understanding of science, technology, art and culture; relationship between available past funding and output;

iii.) Degree of multidisciplinarity and of internationalization, when relevant.

***Criterion B. Scientific and technological merit of the research team*;**

i.) Scientific productivity and merit of the results of the Unit's research, taking into account the relevance of both current and planned research, as well as the level of internationalization of scientific activities, including publications and citations of published works or other relevant aspects;

ii.) Skills and composition of the research team to adequately execute the proposed program;

iii.) Ability to successfully compete for national and international research grants and contracts, including contracts with companies.

C. Scientific merit and innovative nature of the strategic programme;

i.) Relevance, originality and impact of the proposed strategic programme;

ii.) Contributions of the scientific, technological, artistic or cultural activities of the proposed programme;

iii.) Degree of multidisciplinarity and of internationalization, when relevant.

D. Feasibility of the work plan and reasonability of the requested budget;

i.) Organisation of the programme in terms of the proposed objectives and resources (budget, duration, infrastructures); organisation and work environment, with special focus on the adequacy of the research team's critical mass to perform the proposed objectives and on the management of resources directed to research activities, which includes supervision of postgraduate students and post-doctoral involvement in R&D activities;

ii.) Adequacy of proposed budget to accomplish the proposed strategic programme;

iii.) Institutional resources (technical, scientific, organisational and managerial) of the participating entities. The commitment of the host institution in providing the manpower and material resources to implement the proposed programme is especially valued.

E. Impact of the scientific, technological and cultural output;

i.) Production of knowledge likely to stimulate a knowledge-based economy and likely to be used by the productive structures, when applicable;

ii.) Contribution of the R&D Unit to the national and regional economic growth and development;

iii.) Knowledge and technology transfer and its dissemination.

Each criterion is rated on a half-point scale following the table below:

Numeric score	Corresponding wording	Definition
5	Excellent	All relevant aspects of the assessment criteria successfully addressed. Any shortcomings are minor
4 or **4,5**	Very good	Assessment criteria very well addressed/met, although certain improvements are still possible
3 or **3,5**	Good	Assessment criteria well addressed/met, although improvements would be necessary
2 or **2,5**	Fair	Assessment criteria broadly addressed, however there are significant weaknesses
1 or **1,5**	Poor	Assessment criteria addressed in an inadequate manner, or there are serious inherent weaknesses

In the 2nd stage of the evaluation process, the different evaluation criteria are weighted as follows:

Criterion A – 20% to 35%
Criterion B – 20 %
Criterion C – 20%
Criterion D – 20 %
Criterion E – 5% to 20%

The relative weighting of Criteria A and E depends on the specific research profile(s) of the R&D Units (basic research or applied research/experimental development). Therefore, R&D Units with a basic research profile will be assessed with a lower weighting in criterion E (i.e. 5%), which will be balanced by a higher weighting in criterion A (i.e. 35%).

Research Profile		Weight of criterion A	Weight of criterion E
Basic research	Applied research		
76-100%	0-24%	35%	5%
51%-75%	25%-49%	30%	10%
26-50%	50%-74%	25%	15%
0-25%	75-100%	20%	20%

Notes on the evaluation criteria and on criterion E:

Please note that criteria A to D were already assessed at stage 1, although they can now be reviewed to reflect the input from the site visits.

An additional criterion is to be added at stage 2 (**criterion E**). This criterion relates to the impact of the research units (economic and technology transfer).

Panel members are also reminded that the relative impact of criterion E varies from 5% for units declaring 100% basic research to 20% for units declaring 75% or more of applied research. FCT also suggests that the score of criterion E is agreed upon at the final meeting in the context of the discussion of the overall classification of each research unit.

Stage 2 Outcome

The guiding references presented in the table below (fourth column) result from an integrated analysis of the marks given after stage 1 and on the preliminary marks from the site visits, they are only aimed at providing a common framework of value across panels. These guidelines provide background information that reflects the description of the grade provided in the second column and should not be considered binding in any way for the panels. It is within the exclusive mandate of the panels to independently reach consensus on the marks to be attributed to each research unit.

Grade	Description	Stage 2 Cumulative Weighted Score[a]	Guiding reference
Exceptional	R&D Unit recognised as an international reference for its scientific and technological output and exceptional contributions to its area of research	25,00	Up to 10% of the units assessed at stage 2
Excellent	R&D Unit distinguished by the high quality and international merit of its scientific and technology output and with significant contributions to its area of research	< 25,00 ≥ 23,00	In the range of 20% to 35% of the units assessed at stage 2
Very Good	R&D Unit with high quality and national merit and with significant contributions of international relevance in its area of research	< 23,00 ≥ 18,75[1]	
Good	R&D Unit with quality at the national level, reduced internationalisation and some contributions to its area of research	< 18,75 > 15,00[2]	
Fair	R&D Unit without significant contributions to its area of research	≤ 15,00 ≥ 13,75[3]	
Poor	R&D Unit without contributions to its area of research and with other weaknesses.	< 13,75	

Notes

1 Additionally the application must score at least 4 points in each of the ratings of criteria A and C, and it must also score at least 3 points in each of the ratings of criteria B and D.

2 Additionally the application must score at least 3 points in any of the four evaluation criteria ratings.

3 Additionally the application must score at least 3 points in each of the ratings of criteria A and C, and it must also score at least 2 points in each of the ratings of criteria B and D

[a] This will correspond to the sum of the weighted scores given to each criteria, up to two decimal points and with no resource to rounding.

Funding Impact of stage 2 evaluation

Decision made by the panel will impact on the funding level attributed to FCT's research Units. The funding of the Units can comprise two major components, allocated separately:

Core Funding

The **core funding** component will only be allocated to Units classified as "Good" and above (see Table below). The core funding is allocated on the basis of the grade achieved by the Unit, indexed by two other parameters:

- *Laboratory intensity level*: the level proposed by the applicant will be reviewed and *can be revised* by the Panel following discussion ;
- *Dimension of the Unit*: calculated based on the number of PhD integrated members in the Unit (Small: 10 to 40 persons; Medium 41 to 81 persons; Large: more than 81 persons).

DISTRIBUTION OF ANNUAL CORE FUNDING ACCORDING TO LABORATORY INTENSITY LEVELS, DIMENSION AND TO FINAL GRADING OF R&D UNITS

Laboratory Intensity	Dimension	Grade			
		Exceptional (100%)	Excellent (75%)	Very Good (50%)	Good (10%)
High (100%)	Large (100%)	400.000€	300.000€	200.000€	40.000€
	Medium (50%)	200.000€	150.000€	100.000€	20.000€
	Small (25%)	100.000€	75.000€	50.000€	10.000€
Medium (75%)	Large (100%)	300.000€	225.000€	150.000€	30.000€
	Medium (50%)	150.000€	112.500€	75.000€	15.000€
	Small (25%)	75.000€	56.250€	37.500€	7.500€
Low/null (50%)	Large (100%)	200.000€	150.000€	100.000€	20.000€
	Medium (50%)	100.000€	75.000€	50.000€	10.000€
	Small (25%)	50.000€	37.500€	25.000€	5.000€

Strategic funding

Strategic funding will be **additionally** allocated to R&D Units classified as "Exceptional", "Excellent" or "Very Good", taking into consideration the recommendations of the evaluation panels on the strategic budget. **The strategic funding corresponds to the funding requested by the units in their applications**. This requested funding does not include the core funding component.

The adequacy of proposed 'level of resource' to accomplish the proposed strategic programme should be assessed and commented on under criterion D and corrected if necessary.

Stage 2 - Review Panel meetings– guiding principles

All panel discussions will be supported by an FCT panel secretary, who will assist the chair in the conduction of the meetings and all panel members in access the relevant data.

In each panel, discussion will be structured as follows:

1st round:

Each application will be examined in turn, as outlined below. The order of examination (application reference number, preliminary global score, etc.) will be determined by the chair.

- The lead rapporteur will summarise the application, its content, objectives and approach as well as stage 1 consensus report. He/she will then summarise the stage 1 consensus report and the content of site visit report, presenting potential deviation from the marks given through stage 1, eventually suggesting any changes/corrections to the criteria assessment.
- If relevant, the lead rapporteur will also comment the preliminary hearing information (feedback from unit, answer from panel) and special attention will be given to units eventually upgraded.
- The secondary rapporteur will present also his/her views on the application.
- The Site Visit members will be invited to comment.
- The application will be discussed by the whole panel.
- **A score of 1 to 5 will be agreed and attributed to each of the criteria and the cumulative weighted score will result in an overall classification**
- *For all applications, the following should also be agreed:*
    - The final budget proposal for the strategic programme (if the level of resource is considered inadequate, adjustments should be proposed and broadly justified);
    - The final laboratory intensity level and the basic/applied research profile.

2nd round

Once all applications have been discussed, the full lists of applications will be considered for consistency check. The check should address consistency in scoring at overall level (i.e. between applications) as well as coherence between score(s) and comments at individual level. This check may entail iterations.

A brief meeting report should be produced and signed by all panel members. FCT will provide a template and the panel secretary and the chair will write it in collaboration with all panel members.

Feedback on the Smart Specialisation Strategy

Panels should also agree on the alignment of the units' themes with the Smart Specialisation Strategy for Portugal, which presents the 15 national priority themes and a matrix with the alignment of national priorities with the ones at regional level (please refer to annex 2).

The alignment with the national and regional priorities will be mostly reflected by the eligibility to access EU structural funds. Panel members are kindly asked to verify if the strategic plan of the units is aligned to one or more priorities of the country or region, but this is not an evaluation criterion and will not impact on the final classification of the unit or on its level of funding.

Final outcome

The outcome of the evaluation process will be the final classification of each unit, as well as a consensus report that reflects the panel's views and judgment on the quality of each unit.

Stage 2 - Providing Consensus reports

In the context of providing the consensus reports, review panel members are asked to:

- Provide **substantiated comments** for each of the criteria. Identify strengths and weaknesses for each criterion and provide context for the comments. The latter should be consistent with the (criterion's) score agreed at the panel meeting.
- Provide an **overall appraisal which should also reflect the overall classification** achieved by the application.
- Provide feedback on the alignment of the unit's themes with the Smart Specialisation Strategy for Portugal (2014-2020) (e.g. the strategic plan is aligned with one or more topics of the strategy or the strategic plan does not align with any of the topic put forward in the strategy). **The feedback should be provided in the section "Comments to FCT".**

The importance of consensus reports in the whole process is critical. They will be provided to the research units, they should aid them to understand strengths and weaknesses in their application so they may improve on them when needed. Indeed, consensus reports should not include any comment and/or assessment grounded on biased views or that may reproduce stereotypes concerning the country and its culture or a specific scientific area. Review panel members are reminded to:

- Avoid comments that give a description or a summary of the application;
- Always use dispassionate and analytical language: avoid dismissive statements about the research unit, the proposed science, or the scientific field concerned;
- Evaluate the proposed elements and not the elements that they consider should have been proposed.

FCT will assist the panel chair on quality-check of the consensus reports and this may require iterations with rapporteurs.

Important specific points to consider

About the level of funding requested

The panel are asked to comment on the level of strategic funding requested in the units' strategic plans and in particular on the adequacy of the requested funding compared to the proposed activities and objectives.

About the Laboratory Intensity levels

Laboratory intensity levels definition should use the following guidelines

Level	Description
High	Equipment / laboratory and experimental component
Medium	Archives for public use and database infrastructures of national and European value
Low/Null	Absence of significant levels of the elements mentioned above

About the share Fundamental Research/Applied research

The panels are asked to review the share between Fundamental Research/Applied research as proposed by the research unit; confirming the value or suggesting a different one, if required. It is important to note that when considering this share, **only the activities proposed in the research plan should be considered**, i.e. what is the share of fundamental research versus applied research on the activities the research unit plan to achieve in the next years. The information below will allow to clarify and judge the balance of a given research unit between basic research and applied research/experimental development.

According to the FRASCATI manual, three types of R&D may be distinguished:

- Basic research.
- Applied research.
- Experimental development.

Basic research: is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.

Basic research analyses properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws. The reference to no "particular application in view" in the definition of basic research is crucial, as the performer may not know about actual applications when doing the research or responding to survey questionnaires. The results of basic research are not generally sold but are usually published in scientific journals or circulated to interested colleagues. Occasionally, basic research may be "classified" for security reasons.

Basic research can be oriented or directed towards some broad fields of general interest, with the explicit goal of a broad range of applications in the future and form the basis of the solution to recognised or expected, current or future problems or possibilities.

Applied research: is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Applied research is undertaken either to determine possible uses for the findings of basic research or to determine new methods or ways of achieving specific and predetermined objectives. It involves considering the available knowledge and its extension in order to solve particular problems.

Experimental development: is systematic work, drawing on knowledge gained from research

and practical experience that is directed to producing new materials, products and devices; to installing new processes, systems and services; or to improving substantially those already produced or installed.

In the social sciences, experimental development may be defined as the process of translating knowledge gained through research into operational programmes, including demonstration projects undertaken for testing and evaluation purposes. The category has little or no meaning for the humanities.

Examples of the three types of R&D:

	Basic research	**Applied research**	**Experimental development**
Social sciences and humanities	Study of the causal relations between economic conditions and social development	Study of the economic and social causes of the drift of agricultural workers from rural districts to towns, for the purpose of preparing a programme to halt this development in order to support agriculture and prevent social conflicts in industrial areas	Development and testing of a programme of financial assistance to prevent rural migration to large cities
Natural sciences and engineering	Study of a given class of polymerisation reactions under various conditions, of the yield of products and of their chemical and physical properties	Attempt to optimise one of these reactions with respect to the production of polymers with given physical or mechanical properties (making it of particular utility)	"Scaling up" the process which has been optimised at the laboratory level and investigating and evaluating possible methods of producing the polymer and perhaps articles to be made from it

Annex 1: FCT Mission Statements

FCT's mission statements aim to guide FCT´s action for each scientific domain and to define guidelines for the evaluation of each scientific domain, taking into account its specificities.

Life and Health Sciences

- To promote research that significantly adds to knowledge and critical understanding of biological systems;
- To promote interdisciplinary research that can be translated into the development of innovative tools, strategies and applications for the prevention, diagnostic, treatment and cure of diseases, disabilities or disorders that may affect humankind;
- To produce knowledge that will enhance and extend the quality of life of humankind;
- To promote excellent quality research and development, advanced education and knowledge transfer, interdisciplinarity, ensuring national and international competitiveness in the life and health sciences domain for the benefit of the industrial and health sectors
- To support successful translation of ideas, knowledge, skills and technology arising from research into practical applications that benefit the Portuguese economy and society.

Exact Sciences and Engineering

- To promote research that significantly adds to knowledge and critical understanding of the exact sciences and engineering;
- To promote excellent quality research and development, advanced education and knowledge transfer, interdisciplinarity, ensuring national and international competitiveness in the exact sciences and engineering domain for the benefit of the industrial, health, agricultural and environmental sectors.
- To support successful translation of ideas, knowledge, skills and technology arising from research into practical applications that benefit the Portuguese economy and society.

Natural and Environmental Sciences

- To promote research that significantly adds to knowledge and critical understanding of the natural world and the Universe;
- To promote interdisciplinary research that can be effectively applied in the development of innovative tools, strategies and technologies that will allow a new understanding of the atmosphere, hydrosphere, geosphere, and biosphere, and the processes that connect them;
- To produce knowledge that will help sustain the Earth's natural resources;
- To promote excellent quality research and development, advanced education and knowledge transfer, interdisciplinarity, ensuring national and international competitiveness in the natural and environmental sciences domain for the benefit of the industrial, health, agricultural and environmental sectors;
- To support successful translation of ideas, knowledge, skills and technology arising from research into practical applications that benefit the Portuguese economy and society.

Economic and Social Sciences

- To promote research that significantly adds to knowledge and critical understanding of the economic and social sciences;
- To promote the study and understanding of contemporary societies and their public policies, with particular attention to Portugal and to societies with which Portugal has historical relationships;
- To promote excellent quality research and development, advanced education and knowledge transfer, interdisciplinarity, ensuring national and international competitiveness in the economics and social sciences domain for the benefit of the industrial, health, agricultural and environmental sectors;
- To support successful translation of ideas and knowledge that benefit the Portuguese economy and society.

Arts and Humanities

- To promote research that significantly adds to knowledge and critical understanding of the arts and humanities, exploring interdisciplinary and transdisciplinary approaches;
- To enhance the study of Portugal's history, language, arts, and culture, in a comparative and global frame;
- To use the different forms of knowledge in arts and humanities in order to develop a more general scientific culture - inspired by scientific criteria, rigorous methods of inquiry, and creative attitudes of innovative discoveries.

Annex 2: Smart Specialisation Strategy for Portugal (2014-2020)

Following national and regional diagnostics developed in 2013, the economic sectors, the science fields and the technologies where Portugal is (or shows potential to become) competitive/specialized were identified. Subsequently the themes derived from such diagnostics were discussed with relevant stakeholders from Academy and Business sector.

As a result, **15 themes** were selected grouped in 5 thematic clusters each one showing a common rational or close societal objectives.

Thus the **priorities for Portugal** are:

I – CROSS-CUTTING TECHNOLOGIES AND THEIR APPLICATIONS

- **Energy**
- **Information and Communication Technologies**
- **Materials and Raw Materials**

II – INDUSTRY AND PRODUCTION TECHNOLOGIES

- **Production Technologies and Product Industries**
- **Production Technologies and Process Industries**

III – MOBILITY, SPACE AND LOGISTICS

- **Automotive, Aeronautics and Space**
- **Transports, Mobility and Logistics**

IV – NATURAL RESOURCES AND ENVIRONMENT

- **Agro-food**
- **Forest**
- **Blue Economy**
- **Water and Environment**

V – HEALTH, WELL-BEING AND TERRITORY

- **Health**
- **Tourism**
- **Creative Industries**
- **Habitat**

Regions in Portugal (at the NUTS II level) also defined thematic priorities in the scope of their smart specialization strategies.

In the **matrix below** the alignment of national priorities with the ones at regional level is displayed. Two levels for the development (and maturity) of the theme were considered.

The consolidated level accounts for those themes where the country or the region at stake shows competitiveness at international level through the existing capacity and the profile of specialization at scientific, technological and economical dimensions in the European context.

The emerging level refers to those themes where the country or the concerned region shows significant potential for the development of new competitive advantages and enabling structural changes in the economy.

Level of Development		Consolidated (green) / Emerging (blue)							
Thematic Clusters	**National Priority Themes**	**National**	**Norte**	**Centro**	**Lisboa**	**Alentejo**	**Algarve**	**R.A. Madeira**	**R. A. Açores**
I. Cross-cutting technologies and their applications	1. Energy								
	2. Information and Communications Technologies (ICT)								
	3. Materials and Raw-Materials								
II. Industry and Production Technologies	4. Production Technologies and Product Industries								
	5. Production Technologies and Process Industries								
III. Mobility, Space and Logistics	6. Automotive, Aeronautics and Space								
	7. Transport, Mobility and Logistics								
IV. Natural Resources and Environment	8. Agro-food								
	9. Forest								
	10. Blue Economy								
	11. Water and environment								
V. Health, Well Being and Territory	12. Health								
	13. Tourism								
	14. Cultural and Creative Industries								
	15. Habitat								

NOTE:

Consolidated

5	4	3	2	1

Emerging

5	4	3	2	1