



**EVALUATION GUIDE
R&D UNITS EVALUATION 2017-18**

January 2018

Evaluation Guide for R&D Units Evaluation 2017-18

I. Introduction

Context and overall rationale of the R&D Units Multiannual Funding Program

The Portuguese Science and Technology Foundation (FCT) is the Portuguese national Research Funding Organization (RFO) for all areas of knowledge. It has a variety of funding programs which are not fully described here. Among these, the main lines of funding are: Research and Development (R&D) projects, PhD fellowships, contracts of new PhD researchers, scientific infrastructures, R&D Units and international cooperation. All of these involve open calls for applications, independent evaluation by dedicated evaluation panels, collegial decisions on applications by the pertinent evaluation panels, possibility of appeal of the evaluation results by applicants, review of received appeals and final decisions, open publication of evaluation results and funding awards. Since 1996 the evaluation panels for R&D projects and R&D Units are composed by individuals working abroad.

The R&D Units Multiannual Funding Program was initiated in 1993 with the main objective of promoting the institutional organization of the Portuguese research system associated with higher education and not-for-profit institutions in research centers and institutes of the initiative of groups of researchers. An open call was launched for proposals to be submitted directly under the leadership of a Principal Investigator, similarly to what was commonly done for R&D projects. Of 334 applications, 270 were approved for funding following a national evaluation processes.

In 1996, the R&D Units Multiannual Funding Program was thoroughly reformed with the introduction of an international evaluation process with explicit terms of reference for evaluation, funding and organization of the R&D Units, involving site visits to the R&D Units, substantially increasing the overall funding of the Program, and establishing the beginning of a periodic evaluation system every 3 to 4 years. The evaluation process of all the R&D Units previously approved for funding was organized in 22 Evaluation Panels formed solely of researchers working abroad and operating independently for specific areas of R&D. Each Evaluation Panel collegially graded the quality of the corresponding R&D Units in 5 overall quality levels (Poor, Fair, Good, Very Good, Excellent) and produced evaluation reports justifying their assessments and providing recommendations to each R&D Unit, as well as a final report with an overall view of the corresponding research area and general recommendations to FCT. R&D Units with the lowest grade (Poor) were not approved for further funding and the other R&D Units were awarded Base Funding with moderately increasing reference levels per PhD researcher for increasing overall quality levels; Programmatic Funding for special justified purposes was also awarded for some of the R&D Units, based on specific recommendations of the respective Evaluation Panel. Following this evaluation process, an open call for new R&D Units to apply to the Program was launched in 1997; 89 applications were received, of which close to 15% resulting from reorganizations of previously approved R&D Units, mostly according to recommendations of the 1996 Evaluation Panels; several new R&D Units were approved bringing the total of R&D Units in the Program to 337.

The mentioned reform of the R&D Units Multiannual Funding Program in 1996 led Portugal to pioneer the practice of fully international evaluation processes of R&D Units. The Program adopted several features differentiating it from the most frequently adopted models of institutional organization of R&D in other countries at the time, the most important being the national comprehensive institutional organization of R&D activities of higher education and not-for-profit research institutions in a flexible layer of R&D Units of the initiative of the researchers themselves, with boundaries crossing the naturally more rigid structures of universities and polytechnics, their schools and departments. This eased the emergence of interdisciplinary, interdepartmental and interuniversity R&D Units, and their strategic adaptation to new opportunities and to the results of evaluations. Another important feature is that this model led to a direct relationship of the R&D Units leaders with FCT, strengthening their responsibilities, involvement and accountability, and enhanced the role of R&D Units and active researchers in higher education institutions.

It may be useful, for better understanding the specificities of this Portuguese model to roughly compare it with four other models of institutional funding programs, here described boldly but adopted, to a certain extent and at least for some time, in several other countries:

- *Centers of Excellence model* (such as they appeared in Scandinavian countries, USA and some other countries), involving approval of few centers that excel in R&D or have specific missions; the opportunity of stimulus, responsibility and orientation of the vast majority of the R&D system associated to higher education and not-for-profit research institutions by the national Research Funding Organizations (RFO) is lost;
- *University Departments model* (as could be found in UK), with evaluation and funding targeting university departments, frequently not evaluating whole departments, since a fraction of active researchers could be identified for evaluation by each department; besides the mismatch between the evaluation units considered and the full department – inconvenient for organizational management and funding decisions – possible advantages of interdisciplinary and cross-departmental organization are more difficult with this model, and intermediate institutional interlocutors appear between the Research Funding Organization (RFO) and the active researchers, diluting research responsibilities and accountability, and rendering more difficult to trigger scientific leadership and to tap on new research opportunities;
- *National System of Research Centers model* (such as the old French CNRS or Eastern Europe “academies”), with individual centers frequently located next to universities and partially involving their faculty, but being functionally dependent of a national centralized structure, with unified management rules and usually also with its own centrally administrated personnel; besides the difficulties associated with the interaction of the central organization with universities and their departments, there is a tendency for the central structure to become a relatively rigid organization difficult to modernize and to arise administrative burdens associated with the centralized structure;
- *Scientific and Technological Societies/Foundations* (such as the German Max Plank, Fraunhofer and Helmholtz), also with individual centers frequently located next to universities and partially involving universities faculty, where the society/foundation plays the role of a holding with common rules and administrative and strategic resource sharing, with more flexibility than the preceding model and relying on the emergence and academic life-span of individual leaders; this model allows for an

intermediate strategic and organizational structure, particularly suited to large scientific communities, but the opportunity of stimulus, responsibility and orientation of a substantial part of the R&D system associated to higher education and not-for-profit research institutions by a national Research Funding Organization (RFO) is not used as societies tend to consider a kind of centers of excellence, leaving out the wider base of the research system.

Since 1996, FCT launched 5 evaluations (in 1996, 1999, 2003, 2007, 2013) of R&D Units funded in each preceding period, allowing for possible reconfigurations by splitting or merging of former R&D Units as well as applications of new R&D Units. Beginning with the 2007 evaluation, only R&D Units graded Good or above were considered eligible for funding. The first four evaluations evolved continuously on the same model based on learned experience, but the 2013 evaluation introduced a discontinuity in the adopted processes that aroused a wave of discontent and strong criticism in wide groups of national researchers, with some international resonance. We do not enter here in further detail of this evaluation, since after reports of expert groups assigned to analyze the process and the recommendations they provided, it was decided to retake the main principles of the first four evaluations mentioned and to pursue with their evolution and gradual improvement.

Main general orientations for the R&D Units Evaluation 2017-18

1. Five overall quality grading levels

Overall quality of each R&D Unit is also to be **graded in 5 levels**, now designated **Insufficient, Weak, Good, Very Good, Excellent**, to be further described below. **Only R&D Units with overall grade Good, Very Good or Excellent are eligible for funding.**

2. Objectives and components of the funding to be awarded on the basis of the evaluation

The main objectives of the funding to be awarded by FCT on the basis of this evaluation are:

- 1) to promote the organizational base of the national Science and Technology (S&T) system in R&D Units;
- 2) to support the access to shared resources for R&D activities and actions aiming to create, enhance or increase the value of the conditions assured by each R&D Unit for better fulfillment of its goals;
- 3) to complement, as judged appropriate, the funding obtained by R&D Units for general activities and the strengthening of their internationalization, in order to ensure the institutional conditions that increase the potential of a better use of available resources, including the enhancement of joint funding of employment plans of PhD researchers and the support of PhD programs;
- 4) to contribute to additional exploitation costs of results of previous activities and projects of the R&D Unit researchers whose objectives have been successfully accomplished.

This funding is an incentive for researchers to cluster together in centers according to affinities of research goals and organization schemes, where they share basic resources. By its nature, R&D Units funding is not intended to differentiate cost levels of research activities in different areas, which are supposed to be met by funding lines related to specific activities or instruments, such as R&D projects, scientific equipment or other specific activity related grants, and must take into account the number of PhD researchers integrated

in the R&D Unit.

The funding to be awarded within the R&D Units Multiannual Funding Program has two components:

- a) **Base Funding**, to be awarded to R&D Units according to the overall quality grade and to a weighted count of PhD Researchers Integrated in the R&D Unit, with weight 1 for higher education faculty dedicated to such a function on an exclusivity basis or for researchers dedicated to research on an exclusivity basis, weight 0,2 for researchers with a residual dedication to R&D activities (defined by a weekly average of less than 8 hours) and weight 0,5 for other researchers.
- b) **Programmatic Funding**, that can be (or not) awarded to a particular R&D Unit with the overall grade Excellent, Very Good or Good, when justified by a specific proposal of the respective Evaluation Panel on the basis of the assessment of the R&D Unit plan for the next funding period (2019-2022), the results obtained in the 2013-2017, and on the identification of specific needs that, in the Evaluation Panel understanding, should be met by this type of funding, which may include the targeted attribution of funds for:
 - i. supporting a multiannual plan of PhD fellowships for students in PhD programs operating in close connection with the R&D Unit, which will be directly contracted by FCT with the PhD students who will be jointly selected by the R&D Unit and the respective PhD program coordination;
 - ii. contributing to salary costs associated with a multiannual plan for hiring new PhD researchers to be recruited by the R&D Unit through one of its Managing Institutions;
 - iii. contributing to support the R&D Unit internationalization by participation in European or international infrastructures/networks already approved, and of clear and justified relevance for Portugal;
 - iv. other possible support for specific purposes, as selected and justified by the respective Evaluation Panel.

The amount of the whole R&D Units Multiannual Funding Program to be applied in Programmatic Funding is limited to **about one third of the total funding**.

3. Just three evaluation criteria, each one rated in integers 1 to 5

The evaluation criteria will be described in more detail below. They are to be applied to the team of **Integrated Researchers in the R&D Unit application for evaluation**, irrespective of having been or not in the same R&D Unit in the five years period preceding the evaluation.

One individual can only be an **Integrated Researcher** in one R&D Unit, but can be a **Collaborator Researcher** in other R&D Units. The activities or merit of Collaborator Researchers are not to be considered in applying the evaluation criteria and, consequently, are also not to be considered for decision on the overall quality grade by the Evaluation Panel; however, they may be indirectly relevant to exhibit and assess scientific collaborations, contributions to the training of PhD students, and contributions to society and outreach.

For introductory purposes the **3 evaluation criteria** are summarized here as:

- (A) Quality, merit, relevance and internationalization of the R&D activities of the Integrated

Researchers in the R&D Unit Application¹ in the immediately preceding five year period (2013-2017).

(B) Merit of the team of Integrated Researchers.

(C) Appropriateness of objectives, strategy, plan of activities and organization for the following five year period (2018-2022).

The relative importance of the 3 evaluation criteria is to be taken by their order, starting with most important (A): it is given supremacy to actual contributions in the immediately preceding five year period over the merit of the team of researchers (B), and of such merit over intentions or visions for the future (C).

The adoption of just 3 criteria, their simple rating in integers 1 to 5 and the clear relative importance assigned by order to the criteria have the intention of taking full advantage of the collective Evaluation Panel expertise and experience while providing a clear framework for an informed evaluation.

4. Supremacy to the assessment of quality, merit and relevance over quantity of contributions irrespective of their quality

In applying the evaluation criteria, it should be given supremacy to the assessment of quality, merit and relevance over quantity of contributions irrespective of their quality, as the primary objective of S&T public policy is not the increase of the number of publications or other types of contributions irrespective of their quality, but the development and qualification of the national research system and its impact in society. In what concerns publications, content and its academic, scientific, social or economic consequences are considered much more important than publication metrics or judgements based on where they were published.

To facilitate the assessment of quality, merit and relevance, applicants were asked to identify and summarily describe up to 5 contributions that the R&D Unit considers more important of all obtained in 2013-2017 (item 4.2 of the application), to provide through the Internet a limited number of full-text publications (5, 10, 15, 20 for R&D Units with, respectively, <30, 30-59, 60-119, ≥120 Integrated PhD Researchers) published in the same period that the R&D Unit considers more relevant and representative of the work done by the team of Integrated Researchers in the application (item 4.3 of the application), and to indicate a limited number of “Nuclear CV” (3, 5, 10, 15 for R&D Units with, respectively, <30, 30-59, 60-119, ≥120 Integrated PhD Researchers) selected by the R&D Unit for quality, merit, relevance of the associated contributions and representativeness of the activities developed by the R&D Unit (item 8.1 of the application).

Quantitative information also needs to be taken into consideration, as judged appropriate by each Evaluation Panel according to the respective area best practice, and for judging productivity in quality contributions in relation to the size of the team of Integrated Researchers in the R&D Unit application for evaluation, as R&D Units sizes can be very different. For this purpose, the applicants were instructed to provide in the applications submitted for evaluation access to updated Curricula Vitae of all the Integrated

¹ Independently of having been or not researchers of the same R&D Unit in the preceding period or of the R&D Unit being new.

Researchers reporting all the relevant R&D contributions in the period 2013-2017 and easy access to publications references through the ORCID platform.

Applicants were instructed not to include bibliometric information in the submitted applications, not only because such information could not be used for evaluation without validation (including complex methodological validations), but also because it could defocus the required attention on objectives of quality and scientific and social impact to numbers of publications, citations and impact factors, while also running the risk of accentuating negative aspects that have been identified with undesirable scientific practice, unethical behavior (or even fraud), such as: slicing a scientific contribution of important value in several minor contributions making more difficult its use; replicating one significant intellectual contribution under different titles, text forms or data tables/figures increasing bibliometric numbers without new relevant contributions to knowledge; hierarchical authority pressure to be included as author of work done by advisees or junior members of lab, research group, center or department without relevant intellectual contribution; authorship or citations cartels.

In case an Evaluation Panel decides that it is appropriate, for the specific area under evaluation to take into consideration bibliometric data, it must assure that retracted publications, publications with serious flaws or without relevant contributions to knowledge (including those not adding new relevant contributions to previous publications of the same author), and self-citations of any work by one of its authors are not considered.

5. Strengthening, improving and widening the set of R&D Units

It is expected that this evaluation will contribute to strengthen and improve the set of R&D Units, and also to widen it to areas and in institutional settings previously not well covered, such as polytechnic institutes, hospitals and other healthcare units, technology interface centers. It is also expected that it will contribute to densify R&D Units in the national territory. In any case, **R&D Units should assemble a critical capacity adequate to successfully accomplish their objectives and to promote work environments fostering scientific creativity, talent attraction and scientific careers development.** A diversity of organizational models expanding the capacity for tapping on human, technical or infrastructure resources, and reinforcing Portugal international position is welcome.

6. Limited length of applications, especially of small or medium sized R&D Units

The length of applications, besides lists and tables, was limited to what is thought to be reasonably considered by evaluators and also to simplify the preparation of applications. Because of this, the application form allowed extra space to describe Research Groups and their contributions and membership only for R&D Units with >50 Integrated PhD Researchers, and to describe Thematic Lines and the involved Research Groups only for R&D Units with >100 Integrated PhD Researchers. The organization of R&D Units in Research Groups and/or Thematic Lines is optional for all R&D Units, as they consider it appropriate. The adequacy of such organization will be evaluated under criterion (C). Smaller R&D Units that opted to have such forms of organization are supposed to describe them in the application item “R&D Unit Organization for 2018-2022” (item 11.2).

R&D Units with >50 Integrated PhD Researchers and with Research Groups were asked to identify and shortly describe for each Research Group up to 3 contributions considered more important of all obtained in 2013-2017 by its Integrated Researchers (item 9.3.2 of the application).

II. General evaluation scheme

The list of the possible **42 Evaluation Panels (30 disciplinary and 12 thematic)** is given in Appendix I. The granularity of the disciplinary Evaluation Panels was somewhat increased in comparison with the evaluation of 2007 when they were 25, and it was radically increased in comparison with the evaluation of 2013 when they were only 7, but the main difference in comparison with previous evaluations is in the thematic Evaluation Panels since previous evaluations had only one thematic panel (Marine Science and Technology).

Each R&D Unit was called to select in the application form the Evaluation Panel to which it submits its application. As it is required that for an Evaluation Panel to function it has to evaluate at least four R&D Units, some of the listed Evaluation Panels may not function and applications submitted to them will be channeled to an alternative Evaluation Panel found most suitable in dialogue with the applicant R&D Unit.

The opinion of **external reviewers** on specific R&D Units may be requested by FCT or by an Evaluation Panel Coordinator, whenever it is found that the Evaluation Panel members specific expertise does not cover adequately the scope of an R&D Unit.

Any taxonomy cannot fully reflect the diversity occurring in nature, and this also happens for the areas defined for Evaluation Panels and the actual areas of work of R&D Units. The consideration of disciplinary and thematic Evaluation Panels is adopted just for organizational reasons. Also, it is well known that the consideration of some R&D Units by more than one Evaluation Panel, according to its main areas of work, is an unpractical process that usually does not lead to streamlined reliable results, as these cases are treated as exceptions and ownership and full responsibility of such R&D Units by an Evaluation Panel cannot be assured. Even worse results are obtained with the consideration of one extra pluri/trans-disciplinary evaluation panel, as each kind of inter/pluri-disciplinarity requires matching inter/pluri-disciplinary evaluation expertise and it is not possible to assure it for all types of inter/pluri-disciplinarity, resulting in evaluations under such an arrangement being frequently done by just two or three of the panel members in contradiction with the intended purpose of the inter/pluri-disciplinary evaluation itself. **In the present evaluation, inter/pluri-disciplinarity is handled in three ways: (1) by setting up thematic Evaluation Panels for certain inter/pluri-disciplinarity topics of special interest, (2) by adding appropriate extra members to Evaluation Panels that receive several applications with similar kinds of inter/pluri-disciplinarity, and (3) by requesting the opinion on such R&D Units of external reviewers with the needed expertise, for kinds of inter/pluri-disciplinarity that appear in one or few of the R&D Units, which will be considered by the respective Evaluation Panel.**

In case a R&D Unit is assigned to a different Evaluation Panel than the one it initially selected in the application, due to submission of less than three R&D Units to this Evaluation Panel, as described above, opinions on the application will necessarily be asked to at least two external reviewers who are experts in the areas expected to be covered by the Evaluation Panel to which the R&D Unit first submitted the application but could not function. These external reviews will be considered by the Evaluation Panel to which the R&D Unit application was channeled.

For each Evaluation Panel and each R&D Unit there will be 3 sequential phases of the evaluation process:

- (1) Preliminary evaluation of the R&D Unit;

- (2) Site visit evaluation of the R&D Unit;
- (3) Overall evaluation of the R&D Unit.

For each R&D Unit there is an evaluation form for phases (1) and (2) to be filled in by each Evaluation Panel member and one evaluation form for phase (3) to be filled in with contents collegially agreed by the Evaluation Panel. All forms are accessible online through the Internet (see Appendix II).

Phases (1) and (2) and the filling in of the respective evaluation form are procedural steps to facilitate the preparation of (3). The evaluation forms for phases (1) and (2) are seen as internal working documents with no official external value.

The Evaluation Panel prepares the site visits by collegially deciding on specific questions and issues to address in the site visit to each one of the R&D Units, and by producing a list of questions to be addressed to the R&D Unit Coordinator based on the work done in Phase (1). An agenda for the site visit should be prepared and sent in advance to the R&D Unit Coordinator together with any complex questions that may require information that may not be immediately available. Each site visit will include: a brief presentation by the R&D Unit of the main lines of work, objectives and special aspects of funding request, in presence and possibly with the participation of key team members and a wide sample of the different types of Integrated Researchers assured by the R&D Unit, and answers to the specific questions of the Evaluation Panel; a partial visit to the facilities; an interview with the R&D Unit Coordinator and interaction with other key team members, PhD students and post-doctoral researchers; a closed session of the Evaluation Panel to discuss and agree on the site visit outcomes.

The evaluation form of phase (3) contains the collegial final decision of the Evaluation Panel on the R&D Unit and it is, for each one of the R&D Units assigned to the Evaluation Panel, the only official document of the Evaluation Panel with the respective evaluation results. Its contents will be communicated to the R&D Unit at the end of the evaluation process and will be made public afterwards. All members of the Evaluation Panel are supposed to have analyzed the application of each R&D Unit with the detail needed to have a well-informed opinion on its overall evaluation and to actively engage in discussion with the other Evaluation Panel members so as to contribute to the collegial decision to be stated in a unique evaluation form for each R&D Unit. This is why **in phases (1) and (2) each Evaluation Panel member must fill in an evaluation form for each one of the R&D Units considered by the Evaluation Panel.**

To assure depth of analysis, for Phase (1) the Evaluation Panel Coordinator assigns for each R&D Unit at least two members of the Evaluation Panel to act as rapporteurs for the R&D Unit (larger or diversified R&D Units may require more rapporteurs, eventually with targeted tasks to be defined by the Panel Coordinator). The rapporteurs, are supposed to work independently through phases (1) and (2), and will be asked to lead, together with the Panel Coordinator, the discussions on phase (2) and (3) for that R&D Unit. Naturally, the rapporteurs have to go deeply into the fine details of the R&D Unit, but that cannot excuse the other Evaluation Panel members of analyzing sufficiently deeply the application of the R&D Unit to have a well-informed opinion on its overall evaluation and to actively engage in discussion with the rapporteurs and the other Evaluation Panel members.

The part of the evaluation form of each R&D Unit for phase (1) must be filled in by each one of the Evaluation Panel members before initiating the site visits, preferably before arriving in Portugal for the

site visits and face-to-face meetings. The part for phase (2) should be filled in as soon as possible after the site visit.

The evaluation form of phase (3) contains the collegial final decision of the Evaluation Panel on the R&D Unit, including the rating of each of the 3 evaluation criteria in integers 1 to 5 and the overall quality grade in the scale INSUFFICIENT, WEAK, GOOD, VERY GOOD, EXCELLENT, according to the descriptions below, but, for the R&D Units considered by the same Evaluation Panel, consistent with the partial ordering² obtained by considering first Criterion A), second Criterion B) untying R&D Units with equal grade in A) and different grade B), and third Criterion C) untying R&D Units with equal grades A) and B) and different grade C):

EXCELLENT: R&D Unit with a majority of the team of Integrated PhD Researchers having performed innovative R&D of recognized quality and merit, contributing for advancement of knowledge and/or its application, in a national and international perspective, being an international reference in one or more areas of activity, and pursuing objectives, strategy, plan of activities and organization for 2018-2022 which are adequate to the R&D activities.

VERY GOOD: R&D Unit with a majority of the team of Integrated PhD Researchers having performed innovative R&D of recognized quality and merit, contributing for advancement of knowledge and/or its application, in a national and international perspective, being a national reference in one or more areas of activity, and pursuing objectives, strategy, plan of activities and organization for 2018-2022 which are adequate to the R&D activities.

GOOD: R&D Unit with a team of Integrated PhD Researchers having performed innovative R&D of recognized quality and merit, contributing for advancement of knowledge and/or its application in one or more areas of activity, in a national perspective, but with limited or reduced internationalization, and pursuing objectives, strategy, plan of activities and organization for 2018-2022 which are adequate to the R&D activities.

WEAK: R&D Unit with few Integrated PhD Researchers having performed R&D of national and international quality and merit, and the other researchers having performed R&D of limited quality and merit in one or more areas of activity, and/or with serious flaws regarding objectives, strategy, plan of activities and organization for 2018-2022.

INSUFFICIENT: R&D Unit with a majority of the team of Integrated PhD Researchers having not performed R&D of quality and/or merit recognized nationally and internationally, and with few of the researchers having performed R&D of quality and merit recognized nationally and internationally, and/or with serious flaws regarding objectives, strategy, plan of activities and organization for 2018-2022.

² Several R&D Units may have the same overall quality grade; it is not necessary to order them strictly. However, the boundaries separating groups of R&D Units with the same overall quality grade must be consistent with the mentioned partial ordering. The practical way of assuring this is that the Evaluation Panel first collegially decide for each R&D Unit on the evaluation criteria A), B), C) ratings in integers 1 to 5, and only afterwards collegially establish the boundaries separating groups of R&D Units with the same overall quality grade of INSUFFICIENT, WEAK, GOOD, VERY GOOD, EXCELLENT.

After the evaluation of all R&D Units assigned to the Evaluation Panel is finished, the Evaluation Panel must submit a **Final Evaluation Panel Report**.

III. Preliminary and Site Visit Evaluation Form (for each R&D Unit)

01 Identification of Evaluation Panel member

The information in this section is pre-filled in with data from the Evaluation Panels registry:

1.1 Evaluation Panel member name, 1.2 Evaluation Panel designation.

02 Identification of R&D Unit and link to its application

The information in this section is pre-filled in with data from the R&D Unit registry:

2.1 R&D Unit name with link to its application.

03 Phase (1): Preliminary evaluation

Evaluation criterion A): Quality, merit, relevance and extent of internationalization of the R&D activity in 2013-2017 of the Integrated Researchers in the application³ (especially those with PhD), assessed by international standards, considering originality, consistency and rigor, as well as relevance of the results.

For this purpose consider, namely: contributions for knowledge advancement and/or application; publications; advanced training (PhD and PostDoc level); initiation of undergraduate or Master students to research; organization of conferences, colloquia and/or seminars; patents, prototypes or products; knowledge and technology transfer; *spin-offs*; preservation, curation and dissemination of R&D results and data, respecting the principles and practices of Open Science; promotion of scientific and technological culture (outreach); actions of special scientific, technological, cultural, artistic, social or economic relevance to society.

Consider with special attention the up to 5 contributions selected by the R&D Unit as more important of all obtained in 2013-2017 (item 4.2 of the application), the selected full-text publications (item 4.3 of the application).

Take into account the quantity of high quality contributions for judging productivity relative to the size of the team of Integrated Researchers in the R&D Unit application.

Also, take into account the quantity of high quality contributions of researchers of the R&D Unit that depend on the availability of financial resources (namely for Human Resources) relative to the amount of funding received by the R&D Unit for 2013-2017, especially from FCT.

3.1 Rating of evaluation criterion A)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

3.2 Comments and recommendations (in case the R&D Unit has >50 Integrated PhD Researchers it may be necessary to include relevant references to activities of Research Groups)

Include references to specific cases or situations of resources or competencies of exceptional quality or value, detected that may be useful for the FCT of monitoring and steering the development of the National S&T System, including: (i) the response to specific problems of public interest or to challenges faced by society, (ii) the strengthening of internationalization and the use of special opportunities of high value international cooperation or partnership, (iii) the preparation of concerted initiatives aiming at attracting resources for R&D activities from private sources or from outside Portugal, (iv) the opening of new promising avenues of R&D.

6000 characters maximum.

³ Independently of having been or not researchers of the same R&D Unit in the preceding period or of the R&D Unit being new.

Evaluation criterion B): Scientific merit of the team of Integrated Researchers in the application (especially those with PhD), evidence of international and national recognition and, if applicable to the nature of the R&D activities or to objectives of impact in society, also the technical, cultural or artistic merit available in the team, as assessed by the R&D activities in the period 2013-2017.

3.3 Rating of evaluation criterion B)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

3.4 Comments and recommendations

Include references to detected research team talent or competencies of exceptional quality or value that may be useful for the FCT activities of monitoring and steering the development of the national S&T system, similarly to what is requested in A).

3000 characters maximum.

Evaluation criterion C): Adequacy of objectives, strategy, plan of activities (including ethical concerns, whenever applicable), budget, Programmatic Funding request (including the plan of hiring new researchers with the associated co-responsibility of institutions with legal autonomy for hiring processes) and organization for 2018-2022.

The configuration and organization model of the R&D Unit should be suitable to its objectives and R&D activities, and not artificially constructed with unnatural associations or size, and should not result in inappropriate dispersion or concentration of means or resources.

3.5 Rating of evaluation criterion C)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

3.6 Comments and recommendations (*in case the R&D Unit has >100 Integrated PhD Researchers it may be necessary to include relevant references to Thematic Lines*)

6000 characters maximum.

3.7 Points to be clarified during the site visit

3000 characters maximum.

04 Phase (2): Site visit evaluation

Clarify aspects left unclear in the Preliminary evaluation.

*Include assessments of: **leadership; work environment** for fostering scientific creativity, talent attraction and development, and scientific careers development; **facilities and other material resources; technical and secretarial support.***

*Complement the information for **detection of specific cases or resources, research team talent or competencies of exceptional quality or value** that may be useful for the FCT activities of monitoring and steering the development of the national S&T system.*

*Complement the information on **funding sources** and the information relevant for possible awarding of **Programmatic Funding** for each of the specific purposes addressed in the R&D Unit application. Gather information on obstacles to the R&D Unit operation identified by the Coordinator or other key researchers.*

4.1 Corrections or complements to the Preliminary evaluation in Phase (1):

4.1.1 Rating of evaluation criterion A)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

4.1.2 Rating of evaluation criterion B)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

4.1.3 Rating of evaluation criterion C)

(Rate with integers 1 to 5, in increasing value – 5 highest value)

4.1.4 Additional comments and recommendations regarding any of the evaluation criteria
6000 characters maximum.

IV. Overall Evaluation Form (for each R&D Unit)

This form is for the Evaluation Panel collegial assessment of the R&D Unit, taking into account the opinions of Evaluation Panel members based on their preparation supported by their individual forms for Phases (1) and (2) of the R&D Unit evaluation, their critical analyses of external reviews when applicable, and the discussions within the Evaluation Panel. It is accessible for being filled in by any of the Evaluation Panel Members, but it must be submitted by the Evaluation Panel Coordinator, who may assign lead rapporteurs to fill in the bulk of Overall Evaluation Form for each one of the R&D Units.

05 Identification of Evaluation Panel

The information in this section is pre-filled in with data from the Evaluation Panels registry:

5.1 Evaluation Panel designation.

06 Identification of R&D Unit and link to its application

The information in this section is pre-filled in with data from the R&D Unit registry:

6.1 R&D Unit name with link to its application.

07 Decision on acceptance of an R&D Unit with 10 or less Integrated PhD Researchers (only requested in the form for such R&D Units)

The regulations establish the general requirement that an R&D Unit must have >10 Integrated PhD Researchers, but exceptions can be admitted by the Evaluation Panel and justified on the basis of lack of researchers in the respective area, or by the specificity or pioneering character of the relevant activities proposed.

7.1 Select alternatively: TO REJECT/TO EXCEPTIONALLY ACCEPT

7.2 Justification in case of TO EXCEPTIONALLY ACCEPT

(1000 characters maximum)

08 Rating of evaluation criteria

8.1 Criterion A): Quality, merit, relevance and extent of internationalization of the R&D activity in 2013-2017 of the Integrated Researchers in the R&D Unit application⁴ (especially those with PhD), assessed by international standards, considering originality, consistency and rigor, as well as relevance of the results. For this purpose consider, namely: contributions for knowledge advancement and/or application; publications; advanced training (PhD and PostDoc level); initiation of undergraduate or Master students to research; organization of conferences, colloquia and/or seminars; patents, prototypes or products; knowledge and technology transfer; *spin-offs*; preservation, curation and dissemination of R&D results and data, respecting the principles and practices of Open Science; promotion of scientific and technological culture (outreach); actions of special scientific, technological, cultural, artistic, social or economic relevance to society.

(Rate with integers 1 to 5, in increasing value – 5 highest value)

8.2 Criterion B): Scientific merit of the team of Integrated Researchers in the application (especially those with PhD), evidence of international and national recognition and, if applicable to the nature of the R&D

⁴ Independently of having been or not researchers of the same R&D Unit in the preceding period or of the R&D Unit being new.

activities or to objectives of impact in society, also the technical, cultural or artistic merit available in the team, as assessed by the R&D activities in the period 2013-2017.

(Rate with integers 1 to 5, in increasing value – 5 highest value)

8.3 Criterion C): Adequacy of objectives, strategy, plan of activities (including ethical concerns, whenever applicable), budget, Programmatic Funding request (including the plan of contracting new researchers with the associated co-responsibility of institutions with legal autonomy for hiring processes) and organization for 2018-2022.

(Rate with integers 1 to 5, in increasing value – 5 highest value)

09 Overall quality grade

9.1 Grade the R&D Unit according to the descriptions at the end of section II of the Evaluation Guide and respecting the partial ordering obtained by considering first Criterion A), second Criterion B) untying R&D Units with equal grade in A) and different grade B), and third Criterion C) untying R&D Units with equal grades A) and B) and different grade C).

(Select alternatively: Insufficient/Weak/Good/Very Good/Excellent)

10 Justifications, comments and recommendations

10.1 **Justify in detail** the 3 evaluation criteria ratings and the overall grade, and provide **substantive comments and recommendations** regarding R&D activities and results, the team of Integrated Researchers, the objectives, strategy, plan of activities, reasonability of funding and budget (items 15, 16 of the application), organization, ethical concerns whenever applicable, and other aspects that may be considered relevant. Address strengths and weakness of the R&D Unit as a whole and, whenever applicable, comment on Research Groups and/or Thematic Lines. Avoid comments that give a description or a summary of the proposal, do not use the first person or equivalent: “I think...” or “This reviewer finds...”, use sober and analytical language and avoid dismissive statements about the applicants or the proposed science.

(at least 6000 characters of substantive text for small/medium R&D Units, and more for larger R&D Units as needed)

11 Recommendations for Programmatic Funding

Programmatic Funding can be (or not) awarded to an R&D Unit with the overall grade Excellent, Very Good or Good, when justified by a specific proposal of the respective Evaluation Panel on the basis of an assessment of the R&D Unit plan for the next funding period (2019-2022), of the results obtained in 2013-2017 and on the detection of specific needs that, in the Evaluation Panel understanding, should be met by this type of funding, which may include the targeted attribution of funds for the following purposes:

1. Supporting a multiannual plan for PhD fellowships for students in PhD programs operating in close relationship with the R&D Unit.

(Fill in the following table, deciding on the respective R&D Unit request in item 14.1 of the application)

Number of recommended multi-year PhD fellowships to be awarded in each year (2019-2022)

Name of the PhD Program	2019	2020	2021	2022
....

Note: For each year indicate the number of fellowships to be initiated in that year, not the cumulative number of fellowships taking into account those initiated in previous years and being continued, as these fellowships are for a period of up to 4 years.

- Contributing to salary costs associated with a multiannual plan for hiring **new PhD researchers** to be recruited by the R&D Unit through one of its Managing Institutions.

(Fill in the following table, deciding on the respective R&D Unit request in item 14.2 of the application)

Number of recommended new PhD researchers to support hiring in each year (2019-2022)

Type of New Researcher	2019	2020	2021	2022	Recommended % of co-funding by FCT
....	

Notes: (1) For each year indicate the number of new PhD researchers to be hired for the 1st time in that year, not the cumulative number of PhD researchers to hire taking into account those hired in previous years and continuing, as these contracts are for a period of up to 3 years.

(2) % of co-funding by FCT is relative to the following 100% annual reference levels: **38 k€** for Junior Researcher; **56.5 k€** for Auxiliar Researcher (“Investigador Auxiliar”) or equivalent; **63.5 k€** for Principal Researcher (“Investigador Principal”) or equivalent; **82 k€** for Coordinator Researcher (“Investigador Coordenador”) or equivalent.

- Contributing to support the R&D Unit internationalization by participation in European or international infrastructures/networks already approved and of clear and justified relevance for Portugal.

(Fill in the amount of Programmatic Funding recommended for 2019-2022, deciding on the respective R&D Unit request in item 14.3 of the application: ____ thousand euros)

- Other possible support for specific purposes as selected and justified by the respective Evaluation Panel (including co-funding of hiring costs of researchers presently hired with costs totally or partially covered through the R&D Unit, funding of renewal or new Post-Doc fellowships, and other purposes).

(Fill in the amount of Programmatic Funding recommended for 2019-2022, deciding on the respective R&D Unit request in item 14.4 of the application, but possibly including other purposes identified by the Evaluation: ____ thousand euros)

- Justification, comments and recommendations of all the components of recommended Programmatic Funding. For the component for co-funding the hiring of new PhD researchers, comment and recommend on types, assignments, contract conditions and contract duration.

(6000 characters maximum)

12 Submission of the R&D Unit Overall Evaluation Form

12.1 Name of the Evaluation Panel Coordinator, 12.2 Date of submission.

(Submit the Overall Evaluation Form)

V. Final Evaluation Panel Report form

This form is to provide the Final Evaluation Panel Report. It is available for being filled in by any of the Evaluation Panel Members, but must be submitted by the Evaluation Panel Coordinator.

13 General description of specific aspects adopted by the panel for the working methodology

13.1 Describe the aspects of the working methodology adopted by the Evaluation Panel that are not already explicitly contained in the Evaluation Guide.

(Number of characters as needed)

14 Situations of possible Conflicts of Interest

14.1 Identify and describe any situation of possible Conflicts of Interest that have emerged (see Appendix II).

(number of characters as needed)

15 Detection of resources or competencies of exceptional value

15.1 Describe, in all possible detail, the cases or situations of resources, talent or competencies of exceptional quality or value, detected in the evaluated R&D Units, that may be useful for the FCT of monitoring and steering the development of the National S&T System, including:

- (i) the response to specific problems of public interest or to challenges faced by society;
- (ii) the strengthening of internationalization and the use of special opportunities of high value international cooperation or partnership;
- (iii) the preparation of concerted initiatives aiming at attracting resources for R&D activities from private sources or from outside Portugal;
- (iv) the opening of new promising avenues of R&D. Explicitly signal the corresponding R&D Units, Research Groups and researchers, and explain why they are of exceptional quality or value.

(Number of characters as needed)

16 General assessment of the whole area covered by the Evaluation Panel and of the perspectives for its further development

16.1 Provide a substantive general assessment of the whole area covered by the Evaluation Panel and of the perspectives for its further development. Include references to strong and to weak/absent aspects and general recommendations for future development and for the FCT action, and possible improvements of the R&D Units evaluation process.

Add at the end any confidential information the Evaluation Panel wishes to convey to FCT on the R&D Units or its researchers.

(At least 7000 characters of substantive text, and more as needed)

Appendix I: List of Evaluation Panels

EXACT SCIENCES

Mathematics
Physics
Chemistry

NATURAL SCIENCES

Earth and Atmospheric Sciences and Climate Change
Biological Sciences, Biodiversity and Ecosystems
Agricultural, Agro-food and Veterinary Sciences

HEALTH SCIENCES

Biomedicine and Molecular Biology
Clinical and Translational Research
Public Health, Nursing, Health and Sports Technologies, Rehabilitation and Well-being

CIÊNCIAS DE ENGENHARIA E TECNOLOGIAS

Civil and Geological Engineering
Mechanical Engineering and Engineering Systems
Materials Science and Engineering and Nanotechnology
Chemical and Biological Engineering, and Environmentally Sustainable Chemistry
Biomedical Engineering and Bioengineering
Electrical and Computer Engineering
Computer Science and Information Technologies

SOCIAL SCIENCES

Economics
Management
Accounting, Taxation and Financial Management Services
Law and Political Science
Sociology, Anthropology, Demography and Geography
Sciences of Communication
Psychology
Educational Sciences
Language Sciences

ARTS AND HUMANITIES

Literary Studies
Arts and Design, Artistic and Musical Development
Architecture and Urbanism
Philosophy
History and Archaeology

THEMATIC AREAS

Marine Sciences and Technologies
Space Science and Technology and Earth Observation
Mediterranean Studies: Agro-food Systems, Water and Energy Resources, Cultural Heritage
African Studies: Human Development; Institutional Capacity-building in Science and Technology; Identity and Culture
Digital Services – Social, Cultural, Economic or of Public Administration
Industrial Innovation, Robotization and Transformation of Production
Sustainable Energy Systems, Circular Economy and Technologies for the Environment
Tourism, Hospitality and Hotel Management
Cities and Sustainable Mobility
Migrations: Economic, Social or Cultural Aspects, and Associated Public Policies
Inclusion, Multiculturalism and Social Integration
Aging: Work and Social and Cultural Activities in the Life-cycle, Health and Well-being

Appendix II: Internet Access to Proposals and Evaluation Forms and Procedures Regarding Confidentiality and Conflicts of Interest

Internet Access to Proposals and Evaluation Forms

Each Evaluation Panel Member and each External Reviewer will have access to the respective R&D Units proposal and evaluation forms through individual username and password.

Confidentiality

The confidentiality of the R&D Units applications and the evaluation material and results must be protected. All members of Evaluation Panels or external reviewers are asked not to copy, quote or otherwise use material contained in the applications. They are also requested to sign a statement of confidentiality. The text to be accepted, which appears the first time each members of Evaluation Panel or external reviewer accesses the evaluation area, is the following:

STATEMENT OF CONFIDENTIALITY

Thank you for participating in the evaluation of R&D Units submitted to the Portuguese Science and Technology Foundation (FCT). The reader of this message pledges, on his/her honour, not to quote or use in any way, the contents of the applications, nor to make available, other than to FCT or the Evaluation Panel, evaluation material and results.

Conflicts of Interest

Circumstances that could be interpreted as **disqualifying Conflicts of Interest** are laid down in the following criteria:

1. First-degree relationship, marriage, life partnership, domestic partnership;
2. Personal interest in the application's success or financial interest by persons listed under no.1;
3. Current or planned close scientific cooperation;
4. Dependent employment relationship extending five years beyond the conclusion of the relationship;
5. The affiliation or pending transfer to the research unit or to a participating institution;
6. Researchers who are active in a council or similar supervisory board of the applying institution are excluded from participating in the review and decision-making process for applications originating from this institution;

A **potential Conflict of Interest** may exist, even in cases not covered by the disqualifying Conflicts of Interest indicated above, in the following circumstances:

7. Relationships that do not fall under 1, other personal ties or conflicts;
8. Financial interests of persons listed under 7;
9. Participation in university bodies other than those listed under 6, e.g. in scientific advisory committees in the research environment;

10. Research cooperation within the last three years, e.g. joint publications;
11. Preparation of an application or implementation of a project with a closely related research topic (competition);
12. Participating in an on-going scientific or inter-personal conflict with the applicant(s).

Before starting the evaluation of each application, in order to be able to access the evaluation form an Evaluation Panel member or external reviewer needs to complete a Conflicts of Interest Declaration, as follows:

Conflicts of Interest Declaration

Please state:

- No, I do not have Conflicts of Interest
- Yes, I have a Disqualifying Conflict of Interest
- I may have a Potential Conflict of Interest.

(Add any comments below)

An external reviewer will not be able to proceed in case of a strong conflict of interest. In this case the external reviewer is required to inform FCT of the situation, for re-allocation of the review. The Final Evaluation Panel Report must mention all declared Potential Conflicts of Interest.

Should a Conflict of Interest emerge for any Evaluation Panel member, the Panel Coordinator should solve it supported by FCT and an explicit mention of it should be made in the Final Evaluation Panel Report.