# Table of Contents

## INTRODUCTION ................................................................. 4

## CENTRES ASSESSED ...................................................... 7

## METHODOLOGY ............................................................... 9

Process objectives ................................................................. 9
Strategy ................................................................................. 9
Assessment criteria .................................................................. 11
Required documentation ...................................................... 12
The CERCA Assessment Committee (CAC) .......................... 12
Visit to the research institution or centre ............................... 13
The assessment report .......................................................... 13

## ASSESSMENT SCHEDULE 2012-2013 .................................. 14

## EXPENDITURE ANALYSIS ................................................. 15

## ASSESSMENT RESULTS 2012 – 2013 .................................... 16

Mission of CERCA centres ..................................................... 16
Scientific production ............................................................. 17
European projects and grants from the European Research Council (ERC) ......................................................... 17
Internationalisation ............................................................... 18
Scientific Advisory Board (SAB) ............................................. 19
Technology and knowledge transfer ...................................... 19
Scientific platforms .............................................................. 20
Scientific collaboration .......................................................... 20
Facilities .............................................................................. 21
Management ........................................................................ 22
Scientific dissemination ........................................................ 22

## FINAL CONSIDERATIONS ................................................. 23

## EXTERNAL MONITORING REPORT ON THE ASSSESSMENT PROCESS ................................................. 24

## APPENDIX ........................................................................ 25

Appendix 1. Standard report required from centres. 
  First questionnaire used (February 2012) ............................... 26
  Second questionnaire updated as from July 2012 .................. 30
  Third questionnaire updated as from July 2013 ..................... 34
Appendix 2. External monitoring report .................................... 38
Appendix 3. Acronyms ........................................................... 40
Introduction

The periodical assessment of the activity and operation of any system is an essential mechanism for defining and applying policies based on strategic planning. In the case of research centres, assessment is a fundamental practice, habitual in the world’s most advanced and renowned systems. International standards are well defined in this respect and assessments are usually carried out by an independent panel of renowned experts.

Following a mandate from the Catalan Parliament and, subsequently, from the Government, the CERCA Institute has coordinated the assessment of CERCA research centres with the aim of analysing fulfilment of each one’s mission in the last three years. As a result of this action, undertaken between February 2012 and December 2013, more than 500 high added-value recommendations were made to be applied mainly by the management of each centre in the next four years, before the next assessment.
Of the 47 CERCA centres in existence at the time the process began, only Agrotecnio, in the process of approving its articles of incorporation and the Center of Regenerative Medicine in Barcelona (CMRB) have not been assessed. The major structural changes the CMRB has undergone, specifically a change of management associated with a rethinking of the centre’s functions, have so determined. In fact, since the start of the SUMA centres integration programme in 2012, a number of institutes have undergone structural change, integration, mergers, and so on. Such is the case of the Institute of Geomatics (IG), integrated into the Catalan Telecommunications Technology Centre (CTTC) in January 2014 or the Catalan Institute of Nanotechnology (ICN), currently the Catalan Institute of Nanoscience and Nanotechnology (ICN2). The CERCA centres involved in these integration processes during the assessment period are as follows:

- IGTP – Health Sciences Research Institute of the Germans Trias i Pujol Foundation
- IJC – Josep Carreras Leukemia Research Institute
- IMPPC – Institute of Predictive and Personalized Cancer Medicine
- MOVE – Markets, Organizations and Votes in Economics
- IRTA – Institute of Agrifood Research and Technology
- CReSA – Centre of Animal Health Research
- CTFC – Forest Sciences Centre of Catalonia
- IC3 – Catalan Climate Sciences Institute
- ICN2 – Catalan Institute of Nanoscience and Nanotechnology
- CTTC – Telecommunications Technological Center of Catalonia
- IG – Institute of Geomatics (integrated since January 2013)
- ICAC – Catalan Institute of Classical Archaeology
- ICRPC – Catalan Institute for Cultural Heritage Research
- IPHES – Catalan Institute for Human Palaeoecology and Social Evolution

Another point worth mentioning is the high level of internationalisation of the process. It involved a total of 202 assessment experts from all over, less than half of whom were from Spanish institutions. The external scientific advisory board of each was strongly involved with the external assessment committees and included researchers from the United States of America (25), Germany (18), the United Kingdom (14), France (11), Italy (9) and a long et cetera that includes the Netherlands, Canada, Sweden, Switzerland, Israel, Korea and Uruguay.
The CERCA assessors came from institutions such as the French National Institute for Agricultural Research (INRA), Institute of Health and Medical Research (INSERM) and National Centre for Scientific Research (CNRS); the German Max Planck Society, Huawei, Fraunhofer Institute and Archaeological Institute (DAI); European institutions such as the European Molecular Biology Laboratory (EMBL), the CERN, the European Space Agency (ESA) and Fusion For Energy (F4E); the University of Tel Aviv; Telecom Itàlia; ALBA Synchrotron, the Spanish National Cancer Research Centre (CNIO), Tecnalia; Swiss Federal Institute of Technology in Lausanne (EPFL); Roslin Institute, Imperial College London, the University of Oxford; Sloan-Kettering Institute, New York, the Bill and Melinda Gates Foundation, Massachusetts Institute of Technology (MIT) and Harvard, Stanford, Princeton and California universities.

Commitment number 26 of the Catalan Agreement on Research and Innovation (PNRI), in reference to research centres in Catalonia, establishes that they must submit to a ‘periodical assessment of activities and strategic planning by external scientific committees and to international procedures and standards’.

The Government Agreement under which the Government of Catalonia CERCA Programme was created established the CERCA Institute as one of the mechanisms of governance of the CERCA system, in which it is commissioned with the management of the CERCA Programme and the coordination of its research centres. In accordance with the PNRI, the PRI 2010-2013 also established the periodical assessment of CERCA centres as another of the system’s mechanisms of governance, as well as establishing that ‘within a period of two years CERCA centres shall be assessed in regard to criteria of excellence, suitability and strategic focus on challenges for Catalonia specified in the PRI 2010-2013 and compliance with the criteria established in article two (characteristics of CERCA centres). This assessment shall be carried out under the supervision of a benchmark organisation with qualified external independent experts’.

In addition, the Law on fiscal and financial measures of July 2011, in an article referring to CERCA centres, establishes that their organisation should include, inter alia, consulting and periodical assessment of the centre by a high-level external scientific board, in accordance with the standards of excellence in research and knowledge transfer.

It likewise establishes that in order to maintain recognition as a CERCA centre, they should submit to an external scientific assessment of their activity, within two years of the entry into force of said law (July 2011).

Accordingly, the Government of Catalonia, through the Directorate General for Research, commissioned the CERCA Institute (December 2011) to undertake the development of assessments of CERCA research centres in compliance with the Law. This report is the result of the extensive exercise of scientific policy and evaluation of the yield of public money unprecedented in Catalonia.
For the purposes of this report, the centres assessed have been classified according to scientific criteria, by similarity of activity, and not by composition of their structures of government.

Centres assessed

Life Sciences (9)

CRAG – Centre for Research in Agricultural Genomics
CREAF – Centre for Ecological Research and Forestry Applications
CReSA – Centre of Animal Health Research
CRG – Centre for Genomic Regulation
CTFC – Forest Sciences Centre of Catalonia
IBEC – Institute for Bioengineering of Catalonia
ICRA – Catalan Institute for Water Research
IRB Barcelona – Institute for Research in Biomedicine
IRTA – Institute of Agrifood Research and Technology
Medical Sciences (16)

CREAL – Center for Research in Environmental Epidemiology
CRESIB – Barcelona Centre for International Health Research
ICCC – Catalan Institute of Cardiovascular Sciences
IDIBAPS – August Pi i Sunyer Biomedical Research Institute
IDIBELL – Bellvitge Biomedical Research Institute
IDIBGI – Girona Biomedical Research Institute
IGTP – Health Sciences Research Institute of the Germans Trias i Pujol Foundation
IISPV – Pere Virgili Health Research Institute
IJC – Josep Carreras Leukemia Research Institute
IMIM – Hospital del Mar Medical Research Institute
IMPPC – Institute of Predictive and Personalized Cancer Medicine
IRB Lleida – Biomedical Research Institute of Lleida
IR-Sant Pau – Sant Pau Institute of Biomedical Research
IrsiCaixa – Institute for AIDS Research
VHIO – Vall d’Hebron Institute of Oncology
VHIR – Vall d’Hebron Research Institute

Sciences (7)

CRM – Centre for Mathematical Research
IC3 – Catalan Climate Sciences Institute
ICFO – Institute of Photonic Sciences
ICIQ – Institute of Chemical Research of Catalonia
ICN2 – Catalan Institute of Nanoscience and Nanotechnology
IEEC – Institute of Space Studies of Catalonia
IFAE – Institute for High Energy Physics

Engineering (6)

CIMNE – International Center for Numerical Methods in Engineering
CTTC – Telecommunications Technological Center of Catalonia
CVC – Computer Vision Center
i2CAT – Internet and Digital Innovation in Catalonia
IG – Institute of Geomatics (integrated since January 2013)
IREC – Catalonia Institute for Energy Research

Humanities (4)

ICAC – Catalan Institute of Classical Archaeology
ICP – Catalan Institute of Palaeontology Miquel Crusafont
ICRPC – Catalan Institute for Cultural Heritage Research
IPHES – Catalan Institute for Human Palaeoecology and Social Evolution

Social Sciences (3)

CED – Centre for Demographic Studies
CREI – Centre for Research in International Economics
MOVE – Markets, Organizations and Votes in Economics
Methodology

Process objectives

Each CERCA centre has a defined mission and a vision in its articles of association that govern its general scientific activity. The main aim of the CERCA assessment is to measure compliance with the objectives posed by the mission or, if appropriate, its amendment.

Strategy

The aim was for the assessment of CERCA centres to be dynamic and adapted to the context of each centre, which may change. In this respect, the assessments were adjusted to suit each centre’s strategic plan, which is valid for four to six years.

One of the features of CERCA centres is the existence of an external scientific advisory board (SAB) which evaluates the attainment of scientific excellence and monitors the strategic plan. The role of this advisory board is important, as it is entrusted with the continuous monitoring of the centre’s activity, providing advice and recommendations so that it does not deviate from its path towards the international excellence exacted of it. CERCA assessment was coordinated with the meetings of each SAB, on which most of the proceedings centred. In the case of centres that had no SAB, one was created ad hoc.

The chair of each SAB selected some of its members (a maximum of three) to join the CERCA Assessment Committee (CAC). The CERCA Institute put forward as committee members experts in management and knowledge transfer, and one with specific expertise in each field who does not belong to the SAB. Finally, the committee included external observers with experience in assessment processes and the director of the CERCA Institute, who acted as rapporteur.
The actual assessment begins some three months prior to the date of the CAC’s visit, with a meeting of CERCA Institute management, the management of the centre and, in some cases, the principal investigators and members of the SAB. At this meeting the assessment process is explained and the required documentation is requested. The centre has a month in which to prepare the documentation it is to submit to the CERCA Institute. Once received, the CERCA Institute passes it on to the CAC, which then has a month to discuss it.

After this time, on the date agreed, the CAC makes a visit. During the visit, the CAC completes its data in interviews with the director of the centre and researchers, if it deems it necessary.

Following the visit, the CAC has time to discuss the information and issue a final report with its evaluation and recommendations.
Assessment criteria

The centre’s accomplishment of its mission is assessed. In doing so, key concepts within the centre’s means are analysed that could clearly contribute to its fulfilment. In cases where the centre’s mission is not clearly defined or is expressed in obviously possibilist terms, the mission is established by the Law on fiscal and financial measures of July 2011, which specifically states that: ‘Research centres in Catalonia identified as CERCA centres must be entities with their own legal status, non-profit-making, and with headquarters in Catalonia, which have as their main objective research at the frontier of knowledge’. The Assessment Committee evaluates the accomplishment of the mission based on the following criteria:

- What is the quality of scientific production on an international level?
- Is the management structure efficient and proportional to the scientific activity of the centre?
- Is its future vision valid? What infrastructure and resources are required to continue to work in the future?
- Does the centre fit into the Catalan science and technology system, or does it represent duplicity with other structures?
- Are the centres scientific programmes relevant?

ASSESSMENT CRITERIA

1. GENERAL CONCEPTS

MISSION
   a. Relevance and originality of the work programme in terms of the Strategic Plan
   b. Potential for development and future vision
   c. Integration and relevance in the international scientific community. Comparison at international level
   d. Appropriate balance of research, services, knowledge transfer and dissemination
   e. Participation/leadership of international big science initiatives
   f. Capacity to attract and maintain talent

RESULTS
   g. Scientific production/productivity (publications, patents, services, projects, etc.)
   h. Qualitative aspects of publications, creation of spin-offs, royalties
   i. Important posts attained by personnel
   j. Quality of the services provided and level of use
   k. Organisation of events of international importance

2. MANAGEMENT

   a. Management efficiency
   b. Guarantee of process quality
   c. Balance of personnel structure (researcher, technician, management)
   d. Adaptation and potential of infrastructures to the centre’s activity
   e. External income
   f. Personnel structure (age, gender, temporary vs. permanent)
   g. Quality of personnel selection process
   h. Training
   i. Incentives and motivation
   j. Capacity to attract and promote young researchers
   k. Whether the centre has a works council

3. OTHER

   a. Material resources and equipment
   b. Impact on the productive sector, administration and society
   c. Intellectual property management
   d. Management of the ethical aspects of research
   e. Cooperation with universities
   f. Socialisation of main research results
Required documentation

The director of each centre is requested to provide a descriptive report on the current status of the research, management and knowledge in terms of its strategic plan and, above all, in terms of its mission\(^1\). The report is accompanied by the annual report or other documents that help to provide a view of the centre, such as those used in recent assessments for Severo Ochoa or Instituto de Salud Carlos III certification. The data provided must enable international benchmarking of the centre, and determination of the accomplishment of its mission.

The CERCA Assessment Committee (CAC)

The Assessment Committee comprises:
- Three members of the SAB
- An expert in management
- An expert in knowledge transfer, if appropriate
- An external scientific expert
- An external observer with experience in assessment
- A member of the CERCA Institute as rapporteur

The Committee members, the CERCA Institute managers and support staff in general have undertaken to keep in the strictest confidence the matters and content dealt with during the assessment process. The members of the CAC provided by the CERCA Institute made a positive statement regarding their impartiality, the lack of conflict of interests and confidentiality. An attempt was made at all times for the experts assigned by the CERCA Institute—from not strictly scientific fields—to take part in a number of assessments that would give them a broader view of the context.

\(^1\) See standard form in Appendix 1.
Visit to the research institution or centre

The CAC’s visit to the centre lasts a day and starts with a presentation by the centre director in which he sets forth openly any data he considers necessary. Following this, there is a discussion by members of the committee until they reach their conclusions, which will constitute the assessment report.

The CAC meetings are an important part of the assessment and have proved to be of help in refining the level of information, which they would otherwise only receive in the documentation.

The assessment report

Following the visit, the CAC has time to discuss the information and issue a final report with its assessment and recommendations.

The assessment report cannot be appealed, except when it contains obvious errors, in which case the director of the centre may submit a written statement to the CERCA Institute.

As coordinator of the process, the CERCA Institute passes on the final assessment report to the chairs of the boards and governing councils of the CERCA centres (Minister for Economy and Knowledge, Minister for Health, Minister for Agriculture, Livestock, Fisheries, Food and Natural Environment) and the Directorate General for Research. Subsequently, each report is presented as an item on the agenda of all the boards and governing councils of the centres.
Assessment schedule 2012-2013
The cost of an international assessment can reach an average of 10,000 euros. The Government of Catalonia ministries involved in the CERCA centres based their contributions for this exercise on this amount.

In the end, the total cost of the assessments amounted to €215,000, of which almost 80% went to assessment committee members' travel expenses, accommodation and fees.
Assessment results 2012 – 2013

• Mission of CERCA centres
• Scientific production
• European projects and grants from the European Research Council
• Internationalisation
• Scientific Advisory Board (SAB)
• Technology and knowledge transfer
• Scientific platforms
• Scientific collaboration
• Facilities
• Management
• Scientific dissemination

Mission of CERCA centres

Of the 45 CERCA centres assessed, 14 received recommendations from the Assessment Committee to modify their mission or articles of association.

In Medical Sciences, 4 centres received commentaries regarding updating the scientific focus of the centre to distinguish their activity, and also to develop translational research.

In Life Sciences (3), comments referred to including teaching amongst the centres’ activities, and to rethinking the initial scientific scope. Also, in some cases, there was a recommendation to comply with the mission, in its entirety, as certain aspects had been neglected.

In Sciences (2), knowledge transfer and teaching need to be included in the scope of the mission.

In Social Sciences (1), aspects of knowledge transfer to the public administrations and the private sector should also be included.

In Engineering (3), technical recommendations were made, such as not to limit the election of the centre’s director to an institution of a given origin, to make the mission more ambitious by incorporating the concept of high-level research, and to include teaching and knowledge transfer as purposes of CERCA centres.

In Humanities (1), a change of name was proposed in one of the centres assessed, and to reinforce in the mission the results and products in electronic format in regard to knowledge transfer.
**SUMMARY**

In 14 of 45 CERCA centres, aspects of knowledge transfer need emphasising or including in the mission, scientific focus needs rethinking, in some cases the academic purpose that a research centre can develop, and not deviating from compliance with the mission, along with other minor issues, need to be taken into account.

**Scientific production**

In the field of Medical Sciences, in 4 CERCA centres scientific production is excellent according to international criteria; 6 have peaks of quality but are heterogeneous; and at another 6 centres there is clearly room for improvement in their publications output if they are to achieve prestige on an international level.

In Life Sciences, 2 centres show excellent operation in this regard, 3 are heterogeneous and unbalanced, and 4 must make an effort to improve their scientific publications.

In Sciences, the assessment showed a high level of excellent scientific production in 6 CERCA centres, and only at 1 did scientific production not show homogeneous quality in all areas, in the opinion of the assessment committee.

In Social Sciences, 2 centres share parameters of excellence and a third needs to improve.

In 4 Engineering centres, scientific production is excellent and 2 exhibit heterogeneity in this respect.

**European projects and grants from the European Research Council**

In Medical Sciences, 4 CERCA centres are obtaining a good level of funding in European projects, and 3 with European Research Council (ERC) projects. However, 11 centres clearly need to improve their status with regard to European projects in order to be more competitive and thus prevent a drop in Spanish research funding.

In Life Sciences, 4 centres have good status in European projects. Of these, 3 centres are also well placed in awards from the ERC. A further 4 centres clearly need to improve their strategy for attracting EU research projects.
In Sciences, 3 centres are working successfully on European projects, with two of them well placed in regard to ERC projects. Two need to improve to obtain European projects, and at least two more need to try to win ERC projects.

In Social Sciences, the three CERCA centres considered are doing well in regard to ERC projects, but not so well in terms of other types of European projects.

Engineering centres have good status with regard to European projects. However, there is room for improvement, particularly in obtaining ERC projects, as they have very few.

Centres in the area of Humanities need to make an effort to improve in all aspects considered.

**SUMMARY**

Seventeen centres have a high level of attraction of European projects and 12 show good results in terms of ERC grants. There is no absolute overlap of the two parameters mentioned, since, as we have seen, some areas such as Social Sciences had plenty of ERC funding but very few collaborative projects. In Engineering, however, the opposite is true. It can be concluded that at least 21 CERCA centres need to improve their attraction of EU research projects.

In this field of study, we can highlight the need for project coordination, which is still scarce in some centres, or to have staff specialised in the management of European projects. In some cases, the assessment committee proposed measures such as intensifying requests for ERC Proof of Concept grants by researchers who already have a Starting or Advanced Grant.

---

**Internationalisation**

In general, most CERCA centres show a high level of internationalisation.

In Medical Sciences, 6 centres need to make much more effort. Two of them need to make particular efforts to attract international projects beyond those of the European Union.

In Life Sciences, 2 centres need to improve in this respect.

In Social Sciences, one centre needs to improve this aspect.

In Engineering, two centres require improvement.

In Humanities, this is an aspect that two centres need to improve.

**SUMMARY**

Altogether, 13 of the 45 CERCA centres assessed need to improve substantially the internationalisation of their activities. It is recommended in some cases to create mobility programmes for researchers and attract visiting professors who can contribute to creating an international atmosphere in the centre. The use of English in the centres’ internal activities is a recommendation that appears on several occasions in the assessments carried out.
Scientific Advisory Board (SAB)

In some very specific cases the centre has had to create an SAB in order to be able to undertake the CERCA assessment. In regard to the operation of the SAB in Medical Sciences, the assessment committees have issued remarks on their involvement in the selection of top-level researchers (5) and in the assessment of research groups (3). In 2 centres, comments were also made on the need to make the composition of the SAB more international and to draw up a structured working agenda prior to their meetings.

Life Sciences and Engineering received identical recommendations, brief comments on involvement in the selection of top-level researchers (1) and in the assessment of research groups (1), and better structuring of work meetings. This last point was also made in regard to Sciences on 2 occasions.

In Social Sciences, one centre was recommended to involve the SAB in the selection of researchers.

In Humanities, the committee recommended involvement in the selection of top-level researchers (1) and in assessment of research groups (2), and better structuring of work meetings (2).

SUMMARY

It appears that the work dynamic of the SAB in CERCA centres is yielding good results in general and adds value to the CERCA centres. In 9 of the 45 centres, involvement of the SAB is recommended in the recruitment of research personnel; in 7, in the assessment of research groups; and 8 are requested to draw up a working agenda in advance that structures the periodical meetings held, including the scientific focus of the centre.

Also mentioned is the need to make the composition of the SAB more international: in 5 centres it is recommended that it meet periodically; and in 3 cases, that members be appointed that have experience in technology and knowledge transfer.

In one particular case it was requested that a chairman be appointed from among the members of SAB, and in another, that following the merger with another centre, the SAB be reconstituted.

Technology and knowledge transfer

In Medical Sciences, 10 CERCA centres are to draw up an intellectual and industrial property policy (IPP). Eight have been recommended to initiate valorisation, and five were advised to appoint a person or unit to undertake transfer. Two centres are to start technology and knowledge transfer, something they had not done previously.

In Life Sciences, 3 centres need to draw up an internal strategy for processing intellectual property (IP). Another 3 were recommended to undertake valorisation. Only one centre had not undertaken any transfer so far and was encouraged to do so.

In Sciences, 6 CERCA centres must draw up an internal strategy for processing intellectual property (IP); one was recommended to undertake valorisation. Only one needs to start knowledge transfer, having not done it before.

In Engineering, 5 CERCA centres had no IP strategy and are required to draw one up.

In Humanities, this was the case for only one centre.
SUMMARY
Of the 45 CERCA centres assessed, 25 have to write or rewrite their own intellectual and industrial property regulations. But only 4 centres have to start transfer from scratch. Twelve centres have to undertake active valorisation between the results of their projects. In general they are recommended to be in permanent contact with companies, to be aware of any projects that arise. One recurring aspect in most assessments of centres that already have a dynamic is the fact that they need to enter a phase in which they obtain royalties and income from patent licences and from invoicing spin-offs. This would bring stability to an activity that has been atypical so far, due to fluctuations in expenses and income, mainly associated with the sale of derived companies.

More sporadic recommendations were also made on how to become more aggressive in negotiating the economic return on technology, undertaking consultancy activities, creating seed capital funds in the centre to boost the most promising projects, explore international markets, apply for software patents in the USA, and provide support for the growth of local SMEs.

Scientific collaboration
In Medical Sciences, the CERCA centres were recommended to undertake more active collaboration with neighbouring hospitals (8) with universities (6), especially to attract doctoral students, and with other CERCA centres (3). In 3 cases it was stated that more internal collaboration was required between research groups in the same institution, particularly between clinical and basic researchers.

In general, collaboration with hospitals is recommended due mainly to R&D&I staff issues and in order to have access to patient biological samples.

There are also recommendations to collaborate more closely with patient associations.

In Life Sciences, 3 CERCA centres were advised to collaborate more with hospitals, two with universities, and 2 more with other CERCA centres. There were also some more specific directions, such as creating a Joint Research Unit with another CERCA centre, or collaborating with the Catalan and Spanish governments on zoonoses that may affect human health. There was even one case in which the centre was advised to try to have greater influence on the pig and poultry sectors.

In Sciences, the collaboration proposed is slightly different. It was suggested that 4 CERCA centres should collaborate more with universities; 3 with other CERCA centres; three more should ensure more internal collaboration between their own research groups; and, finally, 2 centres should start collaborating with the ALBA Synchrotron.
In Social Sciences, there are very few recommendations to collaborate. There is one noteworthy consolidated case in which a CERCA centre, along with two other institutions, is part of a European circuit that includes London, Barcelona and Milan, in which renowned researchers from outside Europe, mainly Americans, go on a ‘European Tour’ systematically while they are in Europe giving guest lectures.

In Engineering, 3 centres were advised to collaborate with other CERCA centres, one with a university, and another to ensure internal collaboration between its research groups. Noteworthy is the case of one centre that coordinates the Catalan Reference Network of Advanced Materials for Energy between research institutions and groups in Catalonia.

In Humanities, with its own set of recommendations, CERCA centres are encouraged to establish more international collaboration and to attempt to coordinate research efforts on the subject in Catalonia, with universities, research institutions and the Catalan Government’s Directorate General for Cultural Heritage.

SUMMARY
Of the 45 CERCA centres assessed, 13 were recommended to collaborate more with other centres in the system, 11 with universities, 11 with hospitals, and 8 to ensure more internal collaboration between their research groups.

In Medical Sciences, it was concluded that 2 CERCA centres needed more space and should seek larger premises. Another, however, was recommended not to build new premises that had already been designed, as it already had sufficient space and other projects requiring financing. Two CERCA centres were advised to improve all signage leading to the centre, and one to do everything in its power to convince the public administrations that sponsor it to improve public transport to make it easier to reach the centre. Finally, in one case, a centre that is scattered over different locations was recommended to organise periodical retreats for its researchers.

In Life Sciences, one centre’s space is clearly restricted in the science and technology park in which it is located, an issue that should be dealt with over the next few years. Two more centres are also scattered and they need to foster contact between their research groups through retreats or similar gatherings.

In Sciences one centre has to address its need for space in the long term in order to deal with growing experimental projects that require more square metres for research groups. Another CERCA centre is unstable, due to having to pay a very high rent, which is a considerable economic constraint.

In Social Sciences, one centre will have to look for new premises to house its growing projects and the research groups that carry them out.

In Engineering, one centre, which has researchers in a number of locations, was told to bring them together occasionally on retreats.

And, finally, in Humanities, two CERCA centres are about to change buildings.

Facilities
The comments resulting from the CERCA assessments in this section are extremely varied and so cannot be grouped together easily.
SUMMARY

Five of the 45 CERCA centres need more space to implement their scientific programme in the coming years. This does not necessarily mean a change of location but may mean renegotiating the number of square metres they occupy with the institution providing the premises.

Four centres have their research groups spread over a number of locations and need to bring them together periodically to enjoy a shared identity and to coordinate and foster research.

In some cases, entrance to the centre should be made easier by putting up appropriate signs.

Management

Having analysed all the comments made on the different areas, the most significant recommendations are for centres to have a gender policy (4), and to develop an incentives policy to pay researchers on a variable basis (3) in each CERCA centre. In 2 cases out of 45, the assessment revealed that too many staff members are engaged in administration in the centre and this needs to be rationalized.

Other comments were made regarding the need for a management and monitoring system that provides data on research groups. Appropriate indicators should also be developed to measure the management and administration of the centres.

In economic terms, one centre was recommended to attempt to obtain a VAT refund, in accordance with the nature of its activity.

Finally, in one case it was observed that researchers’ pay was too low, below the standard rates, and this makes it difficult to hire new researchers and keep those already on the payroll.

Scientific dissemination

There are no great differences between areas in this regard. Taken together, there are 9 centres that need to improve or start scientific dissemination activities, generally speaking. Engineering (3) is possibly the field where this trend is most obvious.

In 5 more cases, the recommendations are along the lines of focusing dissemination on the general public and young students, to encourage them to go into research.

A further 5 CERCA centres are encouraged to improve their websites to make them more attractive and easier to understand. In 2 cases it was recommended that the centres explore the opportunities offered by the social media.

They are also recommended to link dissemination with sponsorship to make better use of it.

Other remarks propose creating a Community Advisory Board, promoting scientific dissemination amongst young researchers to attract their attention, and to make the most of social events such as the Mobile World Congress in Barcelona.
Some observations made by the assessment committees repeatedly highlighted the need for researchers at some CERCA centres to share a common identity in each centre. As has been observed, this may be aggravated by the fact that a single centre may have its groups in several locations. But it must be said that cases were also highlighted in which an excellent working atmosphere reigned in each institution.

On the positive side, it should be said that the assessments recognise the evaluation processes of individual researchers or groups that are already being carried out in CERCA centres, normally under external supervision in order to guarantee their effectiveness and to prevent a conflict of interest.

Meanwhile, it is also highly recommended to explore fundraising as a means of complementing funding for research activities.

In at least 4 CERCA centres, the assessment calls on major members to be aware of the risk to the viability of the centre if they fail to increase the resources allocated to them.

On a more individual level, centre by centre, recommendations were made such as:

- Develop a professional career for research technicians
- Need to hire more technicians
- Offer more incentives for recruitment
- Focus recruitment on high-level seniors, as there is a risk that some could leave the centre
- Set up a business advisory board
- Delegation of the director’s functions to other management members
- Select a scientific director
- Organise a master’s degree with the university
The CERCA Institution aimed to implement monitoring of the assessment of CERCA centres. To this end, it commissioned an international expert, Dr Willem van Winden, professor at the University of Amsterdam and chairman of the consulting firm Urban IQ, specialised in knowledge society development, to take part as a member of one of the assessment committees. The committee chosen was the IC3, in March 2013, just half-way through the process.

Dr Van Winden’s proposal was an assessment in itinere of the activity that CERCA was undertaking. He joined the CAC as an assessor without the other members, those of the IC3 assessment committee or those appointed by CERCA, knowing his true purpose. This gave him the opportunity to act as an assessor as well as reviewing and evaluating the procedure being followed.

Under these parameters, Dr Van Winden issued an evaluation report and recommendations in which he largely validates the system used. Some of the most important suggestions in the report have led to the way in which assessors appraise the information being amended, making it possible to quantify each centre’s results on a scale from 1 to 5. It also opened up the possibility of interviewing other members of the centre personnel, aside from the director, to obtain other points of view, which also prove interesting. Finally, he also provided as a reference the Standard Evaluation Protocol used by universities and research institutes in the Netherlands.

Dr Van Winden’s intervention has proved most positive for the process and increases confidence in the CERCA Institution in the organising of this type of exercise for the forthcoming assessment in 2016.

---

2 Appendix 2: Complete assessment report in the original English version.
Appendix
Appendix 1
Standard report required from centres.
First questionnaire used (February 2012)

Assessment questionnaire for CERCA institutes

1. Mission
Description of the mission according to the historical documents of the centre. Summary of strengths and weaknesses of the institution. Have the goals set out been achieved? What difficulties and problems need to be resolved?

General concept

- Explain briefly the relevance and originality of the focus of the centre’s work, presenting the main goals and programmes, as well as the vision of future held for the institute. Indicate any possible change of focus in recent years.

- Present a comparison of the centre with three main research institutions at international level, showing how the CERCA institute is ranked among them in terms of the impact of its scientific production, productivity and dimension. Is there any significant overlapping of the centre’s work programme with those of others institutions in Catalonia?

- At the institution, what is regarded as research, what is regarded as services for external users and knowledge transfer, and what is regarded as dissemination? How are these areas connected to each other?

- Describe the actions carried out as part of a leading role or collaboration with international projects or networks of “big science.”

- Attractiveness, especially for scientists from abroad. How is the centre actively implementing the recruitment of excellent senior and junior researchers?
Results

Scientific production and productivity

Report the average number of publications per researcher in the last 3 years.

Fill in the following table with the most significant 10 publications of the institute in the last 3 years.

<table>
<thead>
<tr>
<th>Time period</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of publications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Monographs (authorship)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Individual contributions to collected editions and serials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Articles in peer reviewed journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Articles in other journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Working and discussion papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Editorialship (monographs, collected works)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main work focus 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1. Monographs (authorship)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2. Individual contributions to collected editions and serials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3. Articles in peer reviewed journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4. Articles in other journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5. Working and discussion papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6. Editorialship (monographs, collected works)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main work focus 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1. Monographs (authorship)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2. Individual contributions to collected editions and serials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3. Articles in peer reviewed journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4. Articles in other journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5. Working and discussion papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.6. Editorialship (monographs, collected works)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Services
List the services and consultation services provided by the institution. How is the quality of the service assured?

Projects
Give a brief listing of the 5 most scientifically relevant competitive projects awarded in the last three years, whether or not they are finished yet. The PI should be a member of the institute. The information on the project should include the title, the name of the coordinator, the funding institution, identification of the other partners, and a ½ page summary of the contents and calendar.

Knowledge transfer
Indicate the overall income obtained from the institute through knowledge transfer.

Give a brief listing of the 5 knowledge transfer actions in the last three years that have had the greatest impact (contracts with companies, spin-off company creation, etc.). The information about each action should include the title, the coordinator, the funding institution, identification of the other partners, and a ½ page summary of the contents and calendar, including a description of the expected impact.

Events
Summarize the institute’s main activities in terms of hosting workshops, meetings, congresses, conferences, etc.

Prizes and positions of importance
List the top 5 national or international items.

2. Management

<table>
<thead>
<tr>
<th>Total no. of full-time equivalents</th>
<th>Limited employment contracts funded from basic institutional funding</th>
<th>Women</th>
<th>Women with limited contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of people</td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Academic staff</td>
<td>1. Permanent researchers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predoctoral</td>
<td>2. Postdoctoral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3. Other staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Administration</td>
<td>4. IT and statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Laboratory</td>
<td>5. Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- In-house services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How does the institute measure management quality?
Justify the ratio between academic staff and the rest of personnel
List the main internal scientific facilities that give support to research
What is the ratio between external economic resources and the ones provided by the trustees?
Provide the main figures.
Is there an internal policy on lifelong learning for the institute’s personnel?
Is there an incentive in terms of salary or any other type for the academic and other staff?
Is there anybody within the centre representing the workers to express opinions and to reach agreements on labour issues?
3. Others

Describe how the centre manages ethical issues in projects and actions.

Cooperation with neighbouring universities and others. Explain main contracts, joint appointments of professors, etc.

List the 5 main scientific dissemination actions of the last three years, and describe them very briefly.
Second questionnaire updated as from July 2012

Assessment questionnaire for CERCA institutes

1. Mission
Description of the mission according to the historical documents of the centre. Summary of strengths and weaknesses of the institution. Have the goals set out been achieved? What difficulties and problems need to be resolved?

General concept

• Explain briefly the relevance and originality of the focus of the centre’s work, presenting the main goals and programmes, as well as the vision of future held for the institute. Indicate any possible change of focus in recent years.

• Present a comparison of the centre with three main research institutions at international level, showing how the CERCA institute is ranked them in terms of the impact of its scientific production, productivity and dimension. Is there any significant overlapping of the centre’s work programme with those of other institutions in Catalonia?

• At the institution, what is regarded as research, what is regarded as service for external users (if necessary) and knowledge transfer, and what is regarded as dissemination? How are these areas connected to each other?

• Describe the actions carried out as part of a leading role or collaboration with international projects or networks of “big science”.

• Attractiveness, especially for scientists from abroad. How is the centre actively implementing the recruitment of excellent senior and junior researchers? What does the selection process involve?

• List the institutions of origin of the postdoctoral researchers at the centre in the last three years.
Results

Scientific production and productivity

Report the average number of publications per researcher in the last 3 years.

Fill in the following table with the institute’s most significant 10 publications in the last 3 years, (alternatively, include in the table the 5% of the most significant publications in the last 3 years, in case your institution may reach over 10 publications through his system).

<table>
<thead>
<tr>
<th>Time period</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
</table>
| Total number of publications
  1. Monographs (authorship)
  2. Individual contributions to collected editions and serials
  3. Articles in peer reviewed journals
  4. Articles in other journals
  5. Working and discussion papers
  6. Editorship (monographs, collected works) |        |        |        |

Please, fill the following table for each of the patents:

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>WIPO patent app</th>
<th>US Pub. No.</th>
<th>Filing date</th>
<th>PCT No.</th>
<th>Pub. date</th>
<th>Assignee(s)</th>
</tr>
</thead>
</table>

- If any of the fields are not applicable, leave them blank.

Patents

<table>
<thead>
<tr>
<th>Patents</th>
<th>Licence$^1$</th>
<th>Income$^2$</th>
<th>Expenditure$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span</td>
<td>Abroad</td>
<td>Span</td>
<td>Abroad</td>
</tr>
<tr>
<td>Spain</td>
<td>Abroad</td>
<td>Spain</td>
<td>Abroad</td>
</tr>
</tbody>
</table>

**Appendix 1. Standard report required from centres**
Services
List the services and consultation services provided by the institution (only in the case that they are relevant to the centre’s activity). How is the quality of the service assured?

Projects
Give a brief listing of the 5 most scientifically relevant competitive projects awarded in the last three years, whether or not they are finished yet. (Alternatively, give a brief list of 5% of the most relevant projects in the last three years, should your institution have over 5 projects through this system). The PI should be a member of the institute. The information on the project should include the title, the name of the coordinator, the funding institution, identification of the other partners, and a ½ page summary of the contents and calendar.

Knowledge transfer
Indicate the overall income obtained at the institute through knowledge transfer.

Give a brief listing of the 5 knowledge transfer actions in the last three years that have had the greatest impact (contracts with companies, spin-off company creation, etc…). The information about each action should include the title, the coordinator, the funding institution, identification of the other partners, and a ½ page summary of the contents and calendar, including a description of the expected impact.

Describe the centre’s policy for spin-off companies, including a policy for equity ownership by researchers and the centre or alternatively licensing arrangements between the spin-off companies and the centre with a royalty compensation scheme. Also describe the policy on intellectual property developed by researchers, including ownership of a significant part of the property of each patent, as well as technology transfer policies defining the guidelines for the licensing of such IP.

Events
Summarize the institute’s main activities in terms of hosting workshops, meetings, congresses, conferences, etc.

Prizes and positions of importance
List the top 5 national or international items.
3. Others

Describe how the centre manages ethical issues in projects and actions.

Cooperation with neighbouring universities and others. Explain main contracts, joint appointments of professors, etc.

List the 5 main scientific dissemination actions of the last three years, and describe them very briefly.
Assessment questionnaire for CERCA institutes

1. Mission

Description of the mission according to the historical documents of the centre. Summary of strengths and weaknesses of the institution. Have the goals set out been achieved? What difficulties and problems need to be resolved?

General concept

• Explain briefly the relevance and originality of the focus of the centre's work, presenting the main goals and programmes, as well as the vision of future held for the institute. Indicate any possible change of focus in recent years.

• SWOT analysis.

• Present a comparison of the centre with three main research institutions at international level, showing how the CERCA institute is ranked among them in terms of the impact of its scientific production, productivity and dimension. Include in the comparison of these institutions (if possible): brief description of the institution, number of researchers (senior/postdoc/predoc), number of people on the administrative staff, number of publications in peer-reviewed journals, total IF (per year), mean IF per paper and budget (approx.). Is there any significant overlapping of the centre's work programme with those of other institutions in Catalonia?

• At the institution, what is regarded as research, what is regarded as services for external users (if applicable) and knowledge transfer, and what is regarded as dissemination? How are these areas connected to each other?

• Describe the actions carried out as part of a leading role in or collaboration with international projects or networks of 'big science'.

• Attractiveness, especially for scientists from abroad. How is the centre actively implementing the recruitment of excellent senior and junior researchers? What does the selection process involve? Give details on the main features of the recruitment process.
• List the institutions of origin of the postdoctoral researchers at the centre in the last three years.
• List the ERC grant receivers (StG & AdG), ICREA researchers and any others (RyC, JdC, BdP, …) working at the centre and the number of positions held in the last three years.

Results

Scientific production and productivity

Report the average number of publications per researcher and per year in the last 3 years.

[We understand ‘researcher’ as those people included in the ‘academic staff’ section of the table in section 2, ‘Management’]

Fill in the following table with the institute’s publications in the last 3 years:

<table>
<thead>
<tr>
<th>Time period</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of publications²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Monographs (authorship)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Individual contributions to collected editions and serials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Articles in peer-reviewed journals¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Articles in other journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Working and discussion papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Editorship (monographs, collected works)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Publications involving several organisational units can be listed under all the units involved. When totalling the number of publications, however, please ensure that each publication is only counted once.
² Totals for each item only include contributions published electronically; number to be entered separately in brackets.

Journals which use a review system that complies with the standards applicable in the given subject area. Please explain selections.

1) Provided these are published by the institution.

Include, for the 10 most relevant publications in the last three years (alternatively, include 5% of the most significant publications in the last 3 years, should your institution may reach over 10 publications through the system), the following information:
- Entire bibliographic reference (title, authors, journal, year of publication, institutions of the authors.) [Highlight the authors belonging to the institute in bold.] Also include: journal impact factor, number of citations.
- Short summary.

Patents

<table>
<thead>
<tr>
<th>Patents</th>
<th>Licences¹</th>
<th>Income²</th>
<th>Expenditure³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection rights granted in the past 3 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applications in the past 3 years</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Number of agreements.
² For protection rights, total to be given in €, 000.
³ Total process costs incurred (no R&D costs).
⁴ Total number of all patents, etc., at the institution.

Please, fill in the following table for each of the patents:

- Title
- Authors
- WIPO patent app
- Filing date
- PCT No.
- Pub. date
- Assignee(s)

If any of the fields are not applicable, leave them blank.
Services
List the services and consultation services provided by the institution (only in the case that they are relevant to the centre’s activity). How is the quality of the service assured?

Projects
Give a brief listing of the 5 most scientifically relevant competitive projects awarded in the last three years, whether or not they are finished yet. (Alternatively, give a brief listing of 5% of the most relevant projects in the last three years, should your institution have over 5 projects through this system). The PI should be a member of the institute. The information on the project should include the title, the name of the project coordinator, the funding institution and call identifier, identification of the other partners, and a ½ page summary of the contents and calendar.

Also include the following data: name of the coordinator at the institute; total budget of the project; total funded and CERCA Institute total budget for the project.

Knowledge and technology transfer
Indicate the overall income obtained at the institute through knowledge and technology transfer.

Give a brief listing of the 5 knowledge- and technology-transfer actions in the last three years that have had the greatest impact (contracts with companies, spin-off company creation, etc.). The information about each action should include the title, the coordinator, the funding institution, identification of the other partners, and a ½ page summary of the contents and calendar, including a description of the expected impact.

Describe the centre’s policy for spin-off companies, including a policy for equity ownership by researchers and the centre or, alternatively, licensing arrangements between the spin-off companies and the centre with a royalty compensation scheme. Also describe the policy on intellectual property developed by researchers, including ownership of a significant part of the property of each patent, as well as technology-transfer policies defining the guidelines for the licensing of such IP.
2. Management

<table>
<thead>
<tr>
<th>Total no. of full-time equivalents</th>
<th>Total no. of people</th>
<th>Limited employment contracts funded from basic institutional funding</th>
<th>Women</th>
<th>Women with limited contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Academic staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent researchers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postdoctoral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predoctoral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Other staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- IT and statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- In-house services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How does the institute measure management quality? Are the budget’s chronological milestones always respected?

Justify the ratio between academic R&D and the rest of personnel.

Ratio of foreign personnel in the centre.

List the main internal scientific facilities that give support to research.

What is the ratio between external economic resources and the ones provided by the trustees?

Provide the main figures. For external economic resources, distinguish between national, European and international (outside Europe). Give the ordinary budget settlement for the previous year.

Is there an internal policy on lifelong learning for the institute’s personnel?

Is there an incentive in terms of salary or any other type for the R&D staff?

1 Personnel assigned to the institute, but not necessarily paid by the institute.
Appendix 2
External monitoring report

Some comments on CERCA evaluation procedure

By Willem van Winden,
UrbanIQ/Amsterdam University of Applied Sciences
w.van.winden@urbaniq.nl
Tel. +31 641427013

Introduction
Below are some of my comments on the CERCA-evaluation process. They are based on the participation of the author in the evaluation meeting of the IC3 institute in Barcelona.

General
It is very positive that the CERCA institutes are being evaluated in a systematic way. Evaluation of research institutes can have a number of relevant outcomes. For the funding organisation, it gives insight in the performance, which is important for funding decisions. For the organisation itself, an external evaluation is a catalyst for internal strategic discussions about its mission and strategy, and the panel may bring in many useful new ideas and suggestions.

Goals & Preparation
Before the meeting of the committee, the committee members received a filled-in questionnaire with a lot of relevant information, including scientific outputs, productivity, information on staff, a benchmark, societal relevance and more. The information was quite comprehensive, and the presentation at the beginning was insightful. On remark is that the material could be more compact. It contains too much technical/scientific descriptions of the research projects. One solution is to set the limit on the number of pages per topic. Page 15 of the Dutch Standard Evaluation Protocol (SEP) proposes a set-up for a "self-evaluation report" of max 30 pages.

Moreover, it would be good if the committee members would receive a clear terms of reference (TOR), that explains the main objectives of evaluation, the procedures of the site visit, and the expectations of the board with regard to the evaluation report.

Evaluating what?
In this case, we evaluated the entire institute, including all its research lines. That makes sense given the size of the institute. In case of larger institutes, it is worth considering making a distinction between the institute as a whole, and its main research programmes. The Dutch SEP contains useful guidelines for how to do this.

The panel
The panel consisted, in this case, of a good mix of scientific specialists (the Scientific Advisory Board, SAB), a university professor, a tech transfer expert and government officers, and it also had a strong international presence. It turned out the SAB had had a prior 2-day meeting with key members of the institute. They reported their findings during the panel session, thus giving very
significant input into the discussion. On the other hand, this set-up created an information asymmetry between the SAB and the other panel members. It would have been better if all panel members could receive a report of the SAB meeting before the panel meeting. Moreover, one can ask the question whether the SAB should be part of the panel at all, or should play another role. To what extent are they fully independent of the institute? Alternatively, they can be called upon by the panel to provide their highly valuable input on the scientific quality and productivity of the panel. More on this follows later.

Evaluation criteria

The criteria used to evaluate the centre are in line with international standards; the questionnaire covers all of them. However, there could be a more systematic approach, and even some form of quantification, that would allow cross-centre comparison. The four key aspects are quality, productivity, relevance, and vitality/feasibility. See table 3.1 for an explanation. The verdict could be cast in comparison. The four key aspects are quality, productivity, relevance, and feasibility.

In the final text, the committee should explain its most important considerations, while the conclusion could be summarized in a single term according to a five-point scale, "excellent" meaning world-class research, and "unsatisfactory" meaning below acceptable standards.

Table 3.1 Assessment criteria, sub-criteria and aspects to be considered

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>SUB-CRITERIA</th>
<th>ASPECTS THAT MAY BE CONSIDERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>A1. Quality and scientific relevance of the research</td>
<td>Originality of the ideas and the research approach, including technological aspects; Significance of the contribution to the field; Coherence of the programme Quality of the scientific publications Quality of other output; Scientific and technological relevance</td>
</tr>
<tr>
<td></td>
<td>A2. Leadership</td>
<td>Leadership of primary individuals; Mission and goals; Strategy and policy</td>
</tr>
<tr>
<td></td>
<td>A3. Academic reputation</td>
<td>High position and recognition; Promotion of the programme director and other research staff; Impact and significance of research results in the field</td>
</tr>
<tr>
<td></td>
<td>A4. Resources</td>
<td>Human resources; Funding policies and earning capacity; Relevance of research facilities</td>
</tr>
<tr>
<td></td>
<td>A5. PhD training</td>
<td>Objectives and institutional embedding; Structure of programmes; Supervision; Success rates; Educational resources</td>
</tr>
<tr>
<td>Productivity</td>
<td>B1. Productivity strategy</td>
<td>Productivity goals; Publication strategy; Rewards and sanctions</td>
</tr>
<tr>
<td></td>
<td>B2. Productivity</td>
<td>Scientific publications and PhD thesis; Professional publications; Output for wider audiences; Use of research facilities by third parties</td>
</tr>
<tr>
<td>Relevance</td>
<td>C. Societal relevance</td>
<td>Societal quality; Societal impact; Valorisation</td>
</tr>
<tr>
<td>Vitality and</td>
<td>D1. Strategy</td>
<td>Strategic planning; Incumbents and collaborators; Research topics planned for the near future and their perspective; Flexibility and anticipation of expected changes</td>
</tr>
<tr>
<td>feasibility</td>
<td>D2. SWOT analysis</td>
<td>Analysis of the position of institute and programmes; Analysis of strengths and weaknesses</td>
</tr>
<tr>
<td></td>
<td>D3. Robustness and stability</td>
<td>Research facilities; Financial resources; Staff composition; Mobility and attractiveness; Expertise within the institute</td>
</tr>
</tbody>
</table>
Appendix 3

Acronyms

Agrotecnio – Centre for Research in Agrotechnology
CED – Centre for Demographic Studies
CIMNE – International Center for Numerical Methods in Engineering
CMRB – Center of Regenerative Medicine in Barcelona
CRAG – Centre for Research in Agricultural Genomics
CREAF – Centre for Ecological Research and Forestry Applications
CREAL – Center for Research in Environmental Epidemiology
CREI – Centre for Research in International Economics
CReSA – Centre of Animal Health Research
CRESIB – Barcelona Centre for International Health Research
CRG – Centre for Genomic Regulation
CRM – Centre for Mathematical Research
CTFC – Forest Sciences Centre of Catalonia
CTTC – Telecommunications Technological Center of Catalonia
CVC – Computer Vision Center
i2CAT – Internet and Digital Innovation in Catalonia
IBEC – Institute for Bioengineering of Catalonia
IC3 – Catalan Climate Sciences Institute
ICAC – Catalan Institute of Classical Archaeology
ICCC – Catalan Institute of Cardiovascular Sciences
ICFO – Institute of Photonic Sciences
ICIQ – Institute of Chemical Research of Catalonia
ICN2 – Catalan Institute of Nanoscience and Nanotechnology
ICP – Catalan Institute of Palaeontology Miquel Crusafont
ICRA – Catalan Institute for Water Research
ICRPC – Catalan Institute for Cultural Heritage Research
IDIBAPS – August Pi i Sunyer Biomedical Research Institute
IDIBELL – Bellvitge Biomedical Research Institute
IDIBGI – Girona Biomedical Research Institute
IEEC – Institute of Space Studies of Catalonia
IFAE – Institute for High Energy Physics
IG – Institute of Geomatics
IGTP – Health Sciences Research Institute of the Germans Trias i Pujol Foundation
IISPV – Pere Virgili Health Research Institute
IJC – Josep Carreras Leukemia Research Institute
IMIM – Hospital del Mar Medical Research Institute
IMPPC – Institute of Predictive and Personalized Cancer Medicine
IPHES – Catalan Institute for Human Palaeoecology and Social Evolution
IRB Barcelona – Institute for Research in Biomedicine
IRB Lleida – Biomedical Research Institute of Lleida
IREC – Catalonia Institute for Energy Research
IR-Sant Pau – Sant Pau Institute of Biomedical Research
IrsiCaixa – Institute for AIDS Research
IRTA – Institute of Agrifood Research and Technology
MOVE – Markets, Organizations and Votes in Economics
VHIO – Vall d’Hebron Institute of Oncology
VHIR – Vall d’Hebron Research Institute

PRI – Pacte per a la Recerca i la Innovació (PRI 2010-2013)

Research and Innovation Plan

PNRI – Pacte Nacional per a la Recerca i la Innovació

Catalan Agreement on Research and Innovation

CAC – The CERCA Assessment Committee
SAB – Scientific Advisory Board
ERC – European Research Council
IPP – Intellectual Property Policy