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# Suggested Research Assessment Process

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24 March 2014 / revised 30 July 2014

## **Benchmarking of research**

Suggested Research Assessment Process

technopolis <sub>group</sub>, 24 March 2014 / revised 30 July 2014

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## 1. Introduction

This document outlines a proposed intervention by MOSTA in the Lithuanian system of research evaluation that aims to trigger a significant improvement in the performance of the state-funded research-performing organisations. The essence of the proposal is to use a one-time internationally-conducted Research Assessment Exercise (RAE) across all significant research performing organisations to identify development needs and feed these back to the relevant organisation. The next step will be to integrate lessons from this exercise into the regular process of research evaluation that was established by law in 2010.

This report aims to set the agenda for work to be conducted by MOSTA. Aspects of the design will be reviewed with MOSTA (and may be modified) before it details and implements our suggestions. The report first discusses the reasons why an intervention appears to be necessary. It goes on to describe the aims of the intervention and how it will interact with the already existing performance-based research funding system (PRFS). It describes how the needed peer review panels should be selected, how they should work, how the research groups affected by the assessment should be involved and the amount of work needed from them. Finally, it describes the reporting process and how this should be followed up.

## 2. Why intervene?

Lithuania spends roughly 0.8% of GDP on R&D, compared with almost 2% in the EU. Three quarters of Lithuania's expenditure comes from the state, the rest from business. In highly developed economies, this ratio is the opposite way round, with business doing the majority of the R&D. While other measures are needed in addition, raising the state's expenditure on R&D over time and improving the quality and relevance of that expenditure to society and the economy are necessary in order to create the conditions to become more productive and knowledge intensive.

The performance of the state research system has been improving in recent years, but significant deficits remain in the system.

- The system is fragmented, with multiple universities running small departments covering the same areas and duplications in subject matter between institutes and universities, undermining the development of critical mass and the specialisation needed to do high-quality research
- In many cases, governance of research performing organisations leaves too much power in the hands of staff, which is a brake on modernisation and the development of strategy; research management capabilities are in many cases weak and the incentives to improve them are lacking; institutional funding is often internally reallocated away from high- and towards lower-performing groups
- The research community is insufficiently internationalised, both in the sense of people circulating in and out of the country during their research careers and in terms of participation in international activities such as the EU Framework Programme or the work of the European Science Foundation (now effectively superseded by Science Europe). This is exacerbated by high levels of in-breeding and barriers to the employment of foreigners
- Some of the movement of people is undesirable, in the sense of brain drain, indicating that the national research performing system is comparatively unattractive in the international market for research labour
- Given the weak signals from industry about need, the research performing system over-focuses on 'basic' research because it has insufficient incentives to work in applied areas that are economically important but that go beyond the capabilities of today's industry

- State R&D is overly dependent upon EU structural funds, which are transitional in nature and must over time be replaced by ordinary funding from the nation's own resources

The performance-based system for allocating institutional funding modified in 2010 (the original model was introduced in 2005) has undoubtedly been a critical factor in improving performance but nonetheless suffers important weaknesses:

- It focuses on research quality (although relying largely on quantitative indicators), at the expense of other desirable characteristics such as societal relevance and impacts on innovation
- It uses national peers, making objective assessment difficult, owing to the small size of the research community
- Beyond a numeric score, it provides no feedback to those assessed that would help them understand **how** to improve
- It takes no account of the existing circumstances of the research performing organisations or of their ability and willingness to develop themselves and human capital, notably through PhD education
- It is performed too often (every 3 years), creating administrative burden while failing to leave enough time for institutions to adapt to its results
- Improvements in publication performance – as viewed through bibliometric indicators – have been considerable in recent years, but appear to have been generated through a mixture of genuinely better performance (more and better output) and 'gaming' the system so as to maximise the things that are counted rather than the quantity and quality of research

It is proposed to develop the existing system of allocating institutional research funding by improving the peer review component to the assessment system. This will be done by MOSTA, in cooperation with the Research Council of Lithuania (RCL). This will be a one-off exercise, aiming to generate a lot of feedback both to the research performing organisations and to the state policymaking and funding organisations. The lessons from the exercise will be used to modify the assessment system over the longer term, when the periodicity of the assessment system should be increased from 3 to 5 years. This learning exercise will be supported by structural funds; its lessons for the research and assessment systems can be exploited in future based on national funding.

Key elements of the exercise include:

- Extending the range of assessment criteria beyond (bibliometric) quality
- Use of international peers
- Site visits and feedback to those being assessed
- Development of incentives for consolidation, improved management and better internationalisation

The exercise will be conducted during the rest of 2014.

The exercise is intended to generate both learning and systemic improvement. Key benefits will be:

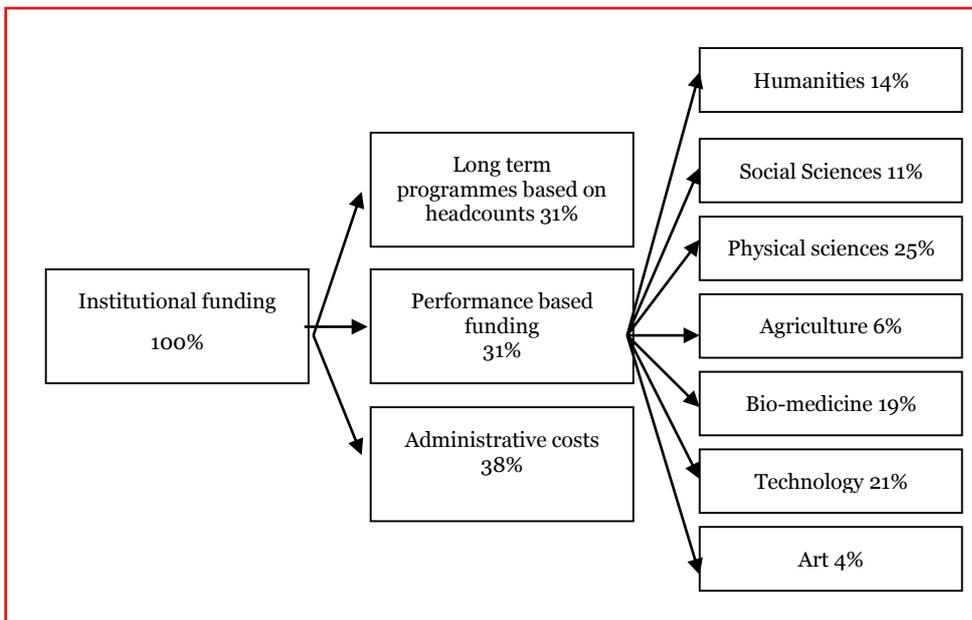
- Subjecting the Lithuanian research performing system to international scrutiny and obtaining feedback not only about the level of quality attained but also how to improve it
- Supporting organisational development and improvement of performance at the level of individual institutions
- Identifying how to make robust improvements to assessment, so as to drive up research performance as opposed to 'gaming'-induced results
- Delivery of an improved assessment system as a basis for allocating institutional research funding in the future

### 3. How does the exercise relate to the existing performance-based research funding system?

The proposed research assessment exercise (RAE) is intended to improve rather than replace the existing performance based research funding system (PFRS), which has been in place since 2005 (with modifications done in 2010). While we have encountered a number of criticisms of that system, it has not yet been evaluated and a number of committees are working to consider whether the detail of its mechanisms should be changed. It would not, therefore, be appropriate to interfere with its logic at this stage. Part of the review exercise currently taking place should be to monitor the extent to which the PFRS has reallocated institutional funding among research performers compared with the previous way of allocating it and to examine the stability of the system's results. Excessive volatility is clearly undesirable as it makes planning and strategy difficult. At the same time, the system should be redistributive if it is to fulfil its purpose. The review exercise should consider whether this process of reallocation is consistent with wider research and innovation policy objectives as well as its effects upon the research community.

As Figure 1 outlines, Institutional funding is allocated based partly on the numbers of research professionals the Education Ministry allows the institutions to employ, partly on their corresponding administration costs and partly based on performance. The 31% of the institutional funding budget that is performance based is allocated among seven major disciplines as shown. The current Lithuanian PFRS contains mechanisms that link external national and international funding as well as industrial funding to institutional funding.

Figure 1 Lithuania: Institutional R&D Funding System



In the PFRS, performance has four components, whose relative importance varies by discipline (Figure 2):

- Quality assessment based on a mixture of peer review and bibliometric indicators
- The monetary value of contract research performed with or for industry
- The value of income from international research programmes
- The value of income from national research grants

Figure 2 Categories of performance-driven funding by discipline

	<b>Humanities</b>	<b>Social Sciences</b>	<b>Physical Sciences</b>	<b>Agriculture</b>	<b>Bio-medicine</b>	<b>Technology</b>	<b>Art</b>
<b>Quality</b>	≤80%	≤80%	≤55%	≤40%	≤55%	≤35%	100%
<b>Industry research</b>	≥5%	≥5%	≥15%	≥15%	≥15%	≥20%	
<b>International research</b>	≤10%	≤10%	≤25%	≤35%	≤25%	≤30%	
<b>National research</b>	≥5%	≥5%	≥5%	≥10%	≥5%	≥15%	

Quality is assessed by dividing the total academic production of those units evaluated into two parts. Part I – which should in the view of those evaluated be the ‘best’ 20% of their output in the assessment period (subject to certain limits and minima on the number of outputs provided) – is scored on a 6-point scale by Lithuanian peers. Scores are aggregated and normalised within each unit being assessed and the resulting profiles are used to establish a quality profile for each and a corresponding number of quality points. Part II is the rest of the academic output for the period, which is assessed using one of a number of discipline-specific points allocation schemes that capture the volume of output, allocates responsibility to authors inside or outside the unit being evaluated and in the hard sciences introduces a weighting based on the impact factors of the journals in which articles have been published. The combined points from I and II then drive the ‘quality’ funding component of the PRFS.

The proposed intervention will involve a process of review by international peers, intended to provide a much broader assessment of performance than the PRFS and – crucially – feedback to Lithuanian researchers and policymakers about how to improve performance. In the course of delivering this assessment, the international peers will take over the assessment of Category I outputs, allowing them to gauge quality and other relevant aspects of research performance while providing the judgements needed by the PRFS. For capacity reasons, it may be necessary to reduce the proportion of Category I outputs that is reviewed. At the conclusion of the exercise, the Council, MOSTA and the responsible ministry can review the experience and decide which aspects of the RAE to incorporate into future PRFS rounds. We propose that these PRFS reviews should be done at five- rather than three-yearly intervals, so that the next round would be done in 2019.

#### 4. The international peer panels

We propose a process of peer review that is based on broad disciplinary panels. Using panels rather than individual peers creates a possibility for discussion and debate within the group of peers, improving the likely quality of their judgements and making it possible to take a better view of interdisciplinary research that involves neighbouring disciplines.

We have reviewed available data about the existing PRFS in order to estimate the numbers of panels and peer reviewers that should be used. The unit of assessment in the PRFS is organisationally defined – typically it is an institute or a faculty – presumably so that the results of the assessment can be connected to specific budget lines for institutional funding, although it appears that organisations do not necessarily allocate the institutional funding received in a direct way to those whose performance drives it. This is not necessarily the optimal way to define a ‘unit of assessment’ – in the sense of a group of people within a research-performing organisation working in a common area or discipline – for a research assessment exercise. Indeed, some of the current units of assessment such as departments of mathematics and informatics clearly work in more than one quite distinct discipline.

Equally, some universities contain organisational entities whose activities overlap – for example they may have both a faculty and an institute working in the same discipline.

Based on the discussions with the Research Council of Lithuania, queries coming from a number of research institutions and background information available to MOSTA certain principles for the composition of the Units of Assessment were agreed upon. A UoA can consist of one or several parts of an Institution. Each Institution can declare their UoAs taking into account restrictions on the min/max size.

### Restrictions on the min size

#### 1. Each UoA should contain not less than 5 conditional researchers<sup>1</sup>.

**1a.** If an Institution has a unit/part with fewer than 5 conditional researchers, one of the following routes should be taken:

- ✓ to joint this unit with another UoA in the same field or
- ✓ not to include this unit in the RAE.

**1b.** If an Institution has a unit/group with 5-10 conditional researchers, this unit should be joined with another UoA in the same field.

### Restrictions on the max size

#### 2. Each UoA should have not more than 150 conditional researchers. This restriction does not apply in case when UoA has researchers working only in one field.

**2a.** If activities of the UoA can be assigned to several research fields and this UoA has **more than 65 conditional researchers** this UoA should be divided into several smaller units (following recommendations on the min unit size).

However, in the absence of more systematic data about the disciplinary structure of the research system, we have used the existing units of assessment as a departure point for our analysis.

The most recent available report of research output<sup>2</sup> shows the production of 181 units of assessment for the year 2011. This amounts to 12,419 individual items. We have categorised the units of assessment in Figure 3,<sup>3</sup> which shows the number of units of assessment within each of the major discipline categories used in Lithuanian legislation and practice. There is no obvious reason to deviate from this structure in setting up panels. The Technology panel would, however, become very large, so this should be split. If necessary, the humanities could conveniently be split into one panel that handles language, literature, culture and history (thus concentrating the subjects where Lithuanian language is most likely to be important) and a second that handles the more international humanities (philosophy, education, theology, and so on). However, if the number of units is manageable the Humanities field can be treated within one panel. Technology is more difficult to split because it is heterogeneous. One obvious option is to separate the electrical and electronics areas into one panel leaving mechanical engineering, construction and a range of applied technology areas in a second panel. On this basis, the first panel would handle about one third of the units of assessment and the second about two thirds.

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<sup>1</sup> A number of conditional researchers (FTE) is being calculated by adding together the number of work places taken up by full-time researchers with 1/3 of the work places taken up by teaching staff

<sup>2</sup> <http://ataskaita.lmt.lt/> Table “2011 metų mokslo ir studijų institucijų mokslinės, meninės ir su jomis susijusios kitos veiklos ataskaitos peržiūra po ekspertinio vertinimo”

<sup>3</sup> Not all the units of assessment can readily be categorised based on their names, but for the present purpose of estimating the size and shape of the RAE this classification is sufficient. More precise allocation will be possible at the detailed design stage

The volume of materials to be reviewed under the current arrangement is very high. Figure 3 shows, based on the number of units of assessment, our initial suggestion for panel structure.

Figure 3 Categories of performance-driven funding by discipline

	<b>Humani- ties</b>	<b>Social Sciences</b>	<b>Physical Sciences</b>	<b>Agricul- ture</b>	<b>Bio- medicine</b>	<b>Techno- logy</b>	<b>Art</b>	<b>Total</b>
<b>Units of Assessment</b>	45	23	28	8	23	44	10	181
<b>Percentage of the total</b>	25%	13%	15%	5%	13%	24%	6%	100%
<b>Number of experts suggested</b>	12 (6 + 6)	6	8	3	6	12 (4 + 8)	3	50

After the consultations at the start of this assessment process and initial review of the composition of various research areas, it was agreed to have nine panels (with 54 experts) for research assessment:

- Humanities
- Social Sciences – two panels
- Physical Sciences
- Agriculture
- Biomedicine – two panels (Medicine and Nature Research)
- Technology – two panels

Arts will not be included in this research assessment.

The number of panellists suggested is based on the following assumptions:

- All units of assessment are to have a site visit
- Each visit will be done by two panel members and require 0.5 days per expert
- The panels will spend a complete week in Lithuania, of which 1.5 days will be plenary sessions and the balance is available for site visits. The one week limit is important because it is unlikely that many peers can make themselves available for a longer time than this
- The amount of material to be read and assessed by the reviewers will be reduced from 20% of the output to a manageable workload (alternatively, additional people will be involved in the process as remote reviewers, who will not be panel members)
- Experts will spend a total of 10 days on the RAE – of which half in Lithuania
- Each panel will require a chair, who should allow an additional 5 days for communication and reporting, making a total of 15 days per chair

Panellists should have the following qualities:

- As individuals
  - Independent
  - International experts in their field
  - Experience in international assessments of research
  - Research work in several countries (will be considered as an advantage)

- Understanding of several research fields (will be considered as an advantage)
- As a group – balanced composition in terms of
  - Experience from range of different national research systems (at least one of them being a country from the Eastern and Central Europe)
  - Disciplinary coverage and in alignment with the Lithuanian institutions being assessed
  - Gender balance
  - Understanding the same research field (with at least two experts in a group meeting this criteria)
  - Current work experience in a university and/or research institute (with at least one expert in a group meeting this criteria)

Panellists and panel chairs will be selected by MOSTA, in consultation with the Research Council of Lithuania. They should not have a conflict of interest, in the sense of collaborating with, being related to or having common economic interests with the people or organisations they are assessing. They should sign a statement of non-conflict of interest.<sup>4</sup>

Panellists should not be resident in Lithuania and as far as possible should not be Lithuanian. In the first instance, we would expect to rely on Lithuanian-speakers from abroad to review materials and research outputs that are specific to Lithuanian language and culture. Outside the Humanities panel dealing with Lithuanian language and literature, we would not expect to assess any materials that are not written in English.

## 5. Process

We assume that the existing units of assessment must be retained in order to continue to operate the national PRFS. An early decision is needed about whether to retain the existing units of assessment for the purposes of the RAE. It is possible to use a more discipline- or theme-orientated structure. IF MOSTA and the Ministry decide to do that, they should insist that the number of units of assessment does not increase beyond the current total.

Units of assessment will then be requested to complete a self-assessment report, using a template to be supplied by MOSTA (see below).

MOSTA will brief panel members and chairs by e-mail ahead of their visits to Lithuania:

- Members will be supplied with templates for
  - Reporting on the quality of individual outputs for the PRFS (in effect, the same templates as the Research Council of Lithuania currently uses, but in English)
  - Reporting on the units of assessment
  - Non-conflict of interest declarations
- In discussion with the chairs, MOSTA and the Council will allocate individual Category I papers to panellists, in line with the current process

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<sup>4</sup> We assume the Research Council of Lithuania already has such a document.

- In discussion with the chairs, MOSTA will allocate each unit of assessment to a pair of panellists, who will assess a selection of outputs
- Panellists will receive the self-assessments from the units of assessment
- Panellists will sign non-conflict declarations and complete both assessments templates ahead of travelling to Lithuania
- MOSTA will prepare site visit schedules and arrange the necessary logistics for the panellists (flights to Lithuania, hotels, internal transport to the visits, subsistence)
- The panels' agendas for the visits to Lithuania should comprise
  - Sunday night: arrive Vilnius
  - Monday: discussion of the completed templates and scores within the panel and with the Research Council of Lithuania and MOSTA (to ensure reporting follows the required forms and is consistent across panels). The PRFS ratings may be modified in the course of the discussion but will not be further reviewed after that time
  - Tuesday – Friday morning: site visits
  - Friday afternoon: review of RAE scores and reports; summary of generic points, allowing the chair to write an overall piece describing the state of the research covered by the panel as a whole and in major individual disciplines
  - Friday evening: depart Vilnius
- A suggested agenda for the site visits is
  - Interviews/group discussion with senior institution/university staff, faculty staff and leaders, where appropriate (max 45-50 min). This should include the head of the particular institution/group being visited
  - A tour of the facilities (30-45 min)
  - Interviews with researchers of the research institution (1-1.5 hours)
- After the week in Lithuania, panellists will pairwise make any needed revisions to their RAE reports and submit these to the chair, who will provide quality control and generate a synthetic overview for the panel as a whole
- MOSTA will assemble the panel reports into an overall synthesis report

## 6. Assessment criteria and self-assessment requirements

While the PRFS has its own criteria, documented elsewhere, the RAE will use the following six:<sup>5</sup>

- Scientific/research quality and Impact on the scientific or research discipline
- Expected economic and social impact in Lithuania
- Physical infrastructure
- Research management (including career development and human resource management)

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<sup>5</sup> These are similar to those used in the Latvian RAE in 2013 except that Research Management and Physical Infrastructure are treated as separate dimensions. In Latvia, these were combined into a single category, leading to a loss of clarity

- Development potential
- Overall score (peers should generate this based on their overall view of the unit of assessment, not by doing arithmetic on the other scores)

The panels will rate each of these dimensions using a five-point scale, from 'Outstanding' to 'Poor' where 5 is 'Outstanding'. Appendix B provides definitions of the scales. These are criterion-referenced to global performance levels, which means that the peers will tend to use the lower values. An alternative is to use more 'generous' scales, referenced more closely to national performance; however, this would mean that the scales are not internationally comparable. The focus of this exercise is to look at how internationally strong Lithuanian research is; hence global performance levels will be looked at. Peers will be asked to produce a text that justifies their scores, so that at the stage of final reporting there is about two pages of textual feedback per unit of assessment, including comments on how to improve performance.

The self-assessments should be prepared in English using a template with the following categories. These are organised so that they provide evidence for the peers to use in generating the ratings above.

### 6.1 Background information

The following background information will have to be collected:

1. Institution name and contact information for the RAE
2. Research profile: proportion of the research effort devoted to various disciplines (this should use a nationally recognised list of disciplines and sub-disciplines)
3. Staff per year for the assessment period, using categories recognised by the research performing institutions, distinguishing between full- and part-time staff and between staff who are research-active and those who are not
4. Where relevant, Bachelors and Masters degrees awarded per year
5. Research funding obtained per year during the period of assessment from the following sources: institutional funding; national competitively-won project funding from the Research Council of Lithuania; national project funding from other state agency sources; national project funding from industry; national funding from foundations or charities; national funding from Structural Funds; Framework Programme funding; funding from other competitive European sources such as COST, Eureka; funding from other international state sources; funding from industry or government abroad.

### 6.2 Scientific or research quality AND expected economic and social impact in Lithuania

The following information will be used in assessing the scientific/research quality:

6. The research output is already provided for the PRFS. Information for five years 2009-2013 will be included. We are waiting to hear from RCL and MOSTA whether it is possible to use this information directly as input to the peer review. The aim is to minimise the extent to which units of assessment have to provide the same information to both RCL and the proposed Research Assessment Exercise.
7. The most outstanding papers produced during the assessment period. Having looked at the initial calculation of the researchers to be potentially considered but not knowing the exact Unit of Assessments and the number of units in a panel, the following suggestion was made about the number of papers to be reviewed by panel experts. A minimum number of publications for review should be five; a maximum number of publications per unit will be calculated based on the formula "1 publication per 10 FTE of academic/research staff".

The peers will consider either the best x papers per researcher or per group, depending on the numbers of active researchers involved.

8. Number of PhDs awarded per year (backed up by a list of names and thesis titles; indicating whether PhDs are registered in the relevant organisation or whether they are registered elsewhere but did a substantial part of their thesis work (>50%) at the organisation. We are aware that there is a risk that this may give inaccurate results as in some research institutions PhD students are “exported” and it is almost impossible to define whether they worked 50% at the organisation or not.
9. Impact on the scientific or research discipline  
This will substantially be assessed using the criteria under point 1, above. In addition, the following apply:
  10. Indicators of esteem during the period: invited presentations in scientific conferences outside Lithuania; membership of editorial boards of journals indexed by Thomson-ISI, Scopus, ERIC or Engineering Village; Scientific prizes awarded during the period of assessment; memberships of peer review panels and scientific advisory boards in academia; membership of scientific advisory boards outside academia (e.g. for government or industry)
  11. Study-visits of one month or more at scientific institutions outside Lithuania
  12. Visitors from outside Lithuania coming to the Unit of Assessment on study-visits of at least one month’s duration
  13. Key non-academic collaborations, e.g. with companies, state producers such as hospitals, etc.
  14. A statement from a research organisation (not exceeding one page) describing the economic, social, cultural, policy or other impacts of the work conducted in the period on Lithuanian society

### 6.3 Physical infrastructure

The following information will be used in assessing physical infrastructure:

15. Key pieces of experimental equipment, scholarly resources such as libraries or databases that cost more than €25,000. In cases where lower-cost resources are key these may also be listed. Make an overall comment (not exceeding one page) on the adequacy of the buildings, equipment and other physical infrastructure to the research needs of the unit of assessment
16. The amount of ‘service’ resource such as technicians’ time available to the group in Full Time Equivalent posts

### 6.4 Research management (including career development and human resource management)

The following information will be used in assessing research management:

17. The group’s research strategy (described in not more than one page)
18. The group’s career development policy: What is the policy and practice concerning PhD education and the role of post-docs? What arrangements are in place for succession? Which active researchers also did their PhD or degree training in the group or organisation (e.g. faculty or university)

### 6.5 Development potential

The following information will be used in assessing development potential:

19. The view of UoA on what the Unit would do with an increase of 25% in institutional funding (described in not more than one page)

## 6.6 Overall score

The peers should generate the overall score based on their overall view of the unit of assessment, not by doing arithmetic on the other scores.

As part of this assessment the following information will be used:

20. A SWOT analysis (described in not more than one page)

## 7. Bibliometrics and other analysis to inform the peer reviews

As bibliometric and other analytical tools have become increasingly available, so the use of peer review is increasingly 'informed' by supplementary information. As in equivalent research assessment exercises elsewhere, it is therefore proposed to supplement the self-assessment with bibliometric analysis. This involves two components.

First, MOSTA will conduct some simple bibliometric analysis at the level of each unit of assessment, using Scopus:

- Raw number of publications per unit of assessment for the period covered by the RAE
- Total citations (both including and excluding self-citations)
- Citations in non-Lithuanian journals
- Average number of citations per publication (both including and excluding self-citations; cross-citation, bibliographic coupling and co-citations should be critically assessed)
- Proportion of publications not cited
- Proportion of publications written in international collaboration
- Proportion of publications written in national collaboration
- Simple performance indicators per researcher within each unit of assessment, e.g. H-index, SNIP

Second, MOSTA will produce simple metrics per unit of assessment including:

- Total and external funding per researcher
- Scopus-indexed publications per researcher
- Citations per researcher (both including and excluding self-citations)

## 8. Reporting

The exercise will be reported in two ways. First, through the use of international peers to input into the national PRFS. Second, via a distinct set of RAE reports that provide commentary and feedback at the levels of:

- The individual units of assessment (peers under the supervision of panel chairs)
- The panels (panel chairs)
- The exercise overall (MOSTA)



## Appendix A Panel structure of the UK Research Excellence Framework

<b>Panels and sub-panels</b>	<b>Members</b>	<b>Assessors</b>
A	17	
1 Clinical medicine	32	8
2 Public Health, Health services and primary care	21	6
3 Allied health professions, dentistry, nursing and pharmacy	35	10
4 Psychology, psychiatry and neuroscience	26	12
5 Biological sciences	27	5
6 Agriculture	20	12
B	19	
7 Earth systems and environmental sciences	18	4
8 Chemistry	17	6
9 Physics	20	4
10 Mathematical sciences	22	15
11 Computing and Informatics	20	10
12 Aeronautical, mechanical, chemical and manufacturing engineering	18	5
13 Electrical and Electronic Engineering, Metallurgy and Materials	19	1
14 Civil and Construction Engineering	12	2
15 General Engineering	22	11
C	22	
16 Architecture, Built Environment and Planning	25	7
17 Geography, Environment Studies and Archaeology	26	12
18 Economics and econometrics	26	7
19 Business and Management Studies	23	13
20 Law	20	14
21 Politics and International Studies	20	8
22 Social Work and Social Policy	26	13
23 Sociology	20	6
24 Anthropology and Development Studies	18	4
25 Education	22	14
26 Sport and Exercise Sciences, Leisure and Tourism	14	3
D	20	
27 Area studies	24	4
28 Modern Languages and Linguistics	26	10
29 English Language and Literature	20	14
30 History	25	16
31 Classics	15	3
32 Philosophy	17	5
33 Theology and Religious Studies	18	1
34 Art and Design: History, Practice and Theory	28	10

35 Music, Drama, Dance and Performing Arts	20	14
36 Communication, Cultural and Media Studies, Library and Information Management	16	8
Totals	820	297

Source: HEFCE

## Appendix B Assessment criteria for the RAE

Figure 4 Assessment criteria for Sub-element A: scientific quality and impact on the scientific discipline

<b>A: SCIENTIFIC/RESEARCH QUALITY and IMPACT ON THE SCIENTIFIC/RESEARCH DISCIPLINE</b>		
Particular factors to take into account		<ul style="list-style-type: none"> <li>• Pure and applied research shall be evaluated as being of equal significance</li> <li>• The impact of the research on the development of the scientific discipline</li> </ul>
SCORE	DEFINITION	DESCRIPTION
<b>5</b>	<b>Outstanding</b>	<p><b>The Unit of Assessment is a <u>Global Leader</u></b></p> <p>In terms of the quality, the research output of a UoA is comparable with the best work internationally in the same area of research. The research possesses the requisite quality to meet highest international standard in terms of originality, significance and accuracy. Work at this level should be a key international reference point in the respective area.</p> <p>In terms of impact, the research outputs of the UoA are published in the leading international forums of the respective discipline, and they have a considerable impact on the development of the discipline worldwide; the UoA is highly valued as a partner in international research projects.</p>
<b>4</b>	<b>Very good</b>	<p><b>The Unit of Assessment is a <u>Strong International Player</u></b></p> <p>Research by the UoA possesses a very good standard of quality in terms of originality and importance. Work at this level can arouse serious interest in the international academic community, and international publishers or journals with the most rigorous standards of publication (irrespective of the place or language of publication) could publish work of this level.</p> <p>In terms of impact, the UoA is internationally recognised in its discipline and is highly regarded as a partner in international research projects and networks.</p>
<b>3</b>	<b>Good level</b>	<p><b>The Unit of Assessment is a <u>Strong National Player with some International Recognition</u></b></p> <p>The importance of research by the UoA is unquestionable in the experts' assessment. Internationally recognised publishers or journals could publish work of this level.</p> <p>In terms of impact, the UoA occupies a stable position in the international scientific community, is considered a respected and recognised centre of competence, and possibly hosts national research centres.</p>
<b>2</b>	<b>Adequate</b>	<p><b>The Unit of Assessment is an <u>Satisfactory National Player</u></b></p> <p>The international academic community deems the significance of the research by the UoA to be acceptable. Nationally recognised publishers or journals could publish work of this level.</p> <p>In terms of impact, the UoA occupies a stable position in the national scientific community. The position of the UoA within the international scientific community is still evolving; it still has to vie for its status as a recognised member of the discipline; its impact on the international scientific community is undetermined.</p>
<b>1</b>	<b>Poor</b>	<p><b>The Unit of Assessment is an <u>Poor National Player</u></b></p> <p>Research by the UoA contains new scientific discoveries only sporadically. The profile of the research by the UoA is expressly national, i.e., the Unit is not involved in international debates of the scientific community. It focuses on introducing international research trends in Lithuania.</p> <p>In terms of impact, the publishing strategy and scientific impact of the UoA are predominantly geared towards the national scientific community.</p>

Figure 5 Assessment criteria for Sub-element B: economic and social impact

<b>B: ECONOMIC AND SOCIAL IMPACT IN LITHUANIA</b>		
Particular factors to take into account		<ul style="list-style-type: none"> <li>The economic and social impact (including culture and gender)</li> </ul>
<b>SCORE</b>	<b>DEFINTION</b>	<b>DESCRIPTION</b>
<b>5</b>	<b>Outstanding</b>	<p><b>Highly Important Research AND Highly Sought-after R&amp;D Partner by Non-academics</b></p> <p>Research of the Unit of Assessment is highly important for society, which renders the Unit a highly esteemed partner in research and development projects outside the academic environment. Staff members of the UoA are in high demand as experts in the public and private sector, and the institution is an important driver of societal development.</p>
<b>4</b>	<b>Very good</b>	<p><b>Very Important Research AND Sought-after R&amp;D Partner by Non-academics</b></p> <p>Research of the UoA is very important for society. The Unit's interactions with non-academics (i.e. business, policy-makers, and the public) stand out in terms of their extensive and dynamic nature.</p>
<b>3</b>	<b>Good</b>	<p><b>Important Research AND Satisfactory Level of Interaction with Non-academics</b></p> <p>Research of the UoA is important for society. The Unit's interactions with non-academics (i.e. business, policy-makers, and the public) are at a level that is expected of recognised academic institutions.</p>
<b>2</b>	<b>Adequate</b>	<p><b>Important Research BUT Low Level of Interaction with Non-academics</b></p> <p>Research of the UoA is important for society. The research activities of the unit are characterised by a low level of interaction with non-academics (i.e. business, policy-makers, and the public).</p>
<b>1</b>	<b>Poor</b>	<p><b>Important Research BUT No Interaction with Non-academics</b></p> <p>Research of the UoA is important for society. The interaction by the Unit with the public is yet to be established.</p>

Figure 6 Assessment criteria for Sub-element C: research environment and infrastructure

<b>C: INFRASTRUCTURE</b>		
Particular factors to take into account		<ul style="list-style-type: none"> <li>• The appropriateness and state of repair of the physical infrastructure</li> <li>• The appropriateness and vintage of equipment and experimental facilities, computing, etc.</li> <li>• The availability and quality of support services, research infrastructure, databases, technical staff</li> </ul>
SCORE	DEFINITION	DESCRIPTION
<b>5</b>	<b>Outstanding</b>	<p><b>The Unit of Assessment is a <u>Global Leader</u></b></p> <p>The Unit's research environment is fully comparable to the best international institutions in the discipline, in terms of the organisation, strategy and infrastructure of research work. It can attract the highest quality international researchers.</p>
<b>4</b>	<b>Very good</b>	<p><b>The Unit of Assessment is a <u>Strong International Player</u></b></p> <p>The Unit is able to provide an internationally comparable excellent research environment to high-level international researchers in the given discipline.</p>
<b>3</b>	<b>Good</b>	<p><b>The Unit of Assessment is a <u>Strong National Player</u></b></p> <p>The Unit is able to provide a research environment that is comparable with globally recognised academic institutions in its discipline.</p>
<b>2</b>	<b>Adequate</b>	<p><b>The Unit of Assessment is a <u>Satisfactory National Player</u></b></p> <p>The Unit's research environment is still evolving to achieve a level that is expected in the international scientific community of a respected institution in the given discipline.</p>
<b>1</b>	<b>Poor</b>	<p><b>The Unit of Assessment is an <u>Poor National Player</u></b></p> <p>The Unit is still only in the process of creating an internationally comparable research environment.</p>

Figure 7 Assessment criteria for Sub-element D: research management

<b>D: RESEARCH MANAGEMENT</b>		
Particular factors to take into account	<ul style="list-style-type: none"> <li>• Organisation of the management of research at the Unit of Assessment</li> <li>• The long-term strategic and financial resource planning, including the human resource development strategy</li> <li>• The goal orientation of the research work</li> <li>• The appropriateness of human research management and allocation, career development, staff teaching and training workload, the ratio of students involved in research to the overall number of staff members, etc.</li> </ul>	
SCORE	DEFINTION	DESCRIPTION
<b>5</b>	<b>Outstanding</b>	<p><b>The Unit of Assessment is a <u>Global Leader</u></b></p> <p>The Unit's research environment is fully comparable to the best international institutions in the discipline, in terms of the organisation, strategy and infrastructure of research work. It can attract the highest quality international researchers.</p>
<b>4</b>	<b>Very good</b>	<p><b>The Unit of Assessment is a <u>Strong International Player</u></b></p> <p>The Unit is able to provide an internationally comparable excellent research environment to high-level international researchers in the given discipline.</p>
<b>3</b>	<b>Good</b>	<p><b>The Unit of Assessment is a <u>Strong National Player</u></b></p> <p>The Unit is able to provide a research environment that is comparable with globally recognised academic institutions in its discipline.</p>
<b>2</b>	<b>Adequate</b>	<p><b>The Unit of Assessment is a <u>Satisfactory National Player</u></b></p> <p>The Unit's research environment is still evolving to achieve a level that is expected in the international scientific community of a respected institution in the given discipline.</p>
<b>1</b>	<b>Poor</b>	<p><b>The Unit of Assessment is an <u>Poor National Player</u></b></p> <p>The Unit is still only in the process of creating an internationally comparable research environment.</p>

Figure 8 Assessment criteria for Sub-element E: development potential

<b>E: DEVELOPMENT POTENTIAL</b>		
Particular factors to take into account	<p>The development potential of an Unit of Assessment comprises:</p> <ul style="list-style-type: none"> <li>• The ability of researchers to participate in international competition</li> <li>• The capability of the scientific environment to support the chosen research</li> <li>• The capability of the selected scientific objectives and research themes to impact the international scientific community and society at large</li> <li>• The ability to initiate new research directions</li> </ul> <p>The assessment should focus on:</p> <ul style="list-style-type: none"> <li>• The Unit’s future vision and plans</li> <li>• How realistically the UoA assesses its strengths and weaknesses, opportunities and threat, and whether the institution has a carefully considered plan to manage such factors</li> <li>• Plus                             <ul style="list-style-type: none"> <li>– The age and career progression of the active scientific staff</li> <li>– The size of the Unit (does it have critical mass) and its ability to attract high-level doctoral students and scientists from abroad</li> <li>– Ability to raise funding that is awarded competitively</li> <li>– Its orientation towards topical issues in the selection of research themes</li> <li>– Involvement in promising international collaboration projects and networks, etc.</li> </ul> </li> </ul>	
SCORE	DEFINITION	DESCRIPTION
<b>5</b>	<b>Outstanding</b>	<p><b>High potential to become <u>Global Leader</u></b>                      The Unit is able to assume (or maintain) scientific leadership in the given scientific discipline. It is expected that over the next 5-10 years it will achieve a significant international breakthrough in the particular scientific discipline, and it will attract leading researchers and promising doctoral students. Within the foreseeable future, the Unit is able to achieve a level of excellence that is comparable with the most outstanding institutions in the world within their discipline.</p>
<b>4</b>	<b>Very good</b>	<p><b>Potential to become <u>Strong International Player</u></b>                      The Unit of Assessment is able to establish (or maintain) itself as a recognised and respected player in the international scientific community within the given scientific discipline. It is expected that over the next 5-10 years it will achieve an excellent level of scientific quality and influence and will become a highly regarded partner in international collaboration projects and networks.</p>
<b>3</b>	<b>Good</b>	<p><b>Potential to become <u>International Player</u></b>                      Over the next 5-10 years the Unit of Assessment will be able to strengthen (or maintain) its position in the international scientific community as a convincing actor and a trustworthy partner within international collaboration networks.</p>
<b>2</b>	<b>Adequate</b>	<p><b>Potential to become <u>Strong National Player</u></b>                      The Unit of Assessment is capable of being (or remaining) a visible local player in its area of research, which from time to time can be expected to contribute to the activities of the international scientific community.</p>
<b>1</b>	<b>Poor</b>	<p><b>Very Limited Scope for Developing its Research Quality and Reputation</b>                      The Unit of Assessment has to work hard to establish itself as an internationally notable institution in its discipline within the foreseeable future.</p>

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