



# Efficiency and flexibility in research funding

A comparative study of funding instruments and review criteria

Liv Langfeldt  
Lisa Scordato

Report 2016:9

**NIFU**



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# Preface

This study was commissioned by the Research Council of Norway in order to provide input to their ongoing project to improve their processes, including the structure and operation of funding instruments and review criteria.

Liv Langfeldt (project leader) and Lisa Scordato at NIFU have conducted the project. We are indebted to survey respondents (reviewers of RCN proposals), and informants in the studied funding agencies, and who took the time and effort to assist our data collection and share their experiences concerning funding instruments and review criteria.

Oslo, June 2016

Sveinung Skule  
Director

Espen Solberg  
Head of Research



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# Executive summary

Funding instruments and review criteria are key elements in how a research funding agency operationalises policy objectives into funding decisions. This report addresses the needs and benefits of tailoring funding instruments and review criteria according to policy aims and target groups, vs. the needs and benefits of harmonising instruments and criteria across the funding agency.

We compare funding instruments and review criteria in national funding agencies in five different countries, USA (NSF), Sweden (VINNOVA), the Netherlands (NWO), UK (NERC) and Norway (RCN), as well as in the Horizon 2020 and the European Research Council (ERC). We also summarise previous issues and conclusions regarding funding instruments and review criteria, based on academic literature as well as policy reports (Sections 2.1 and 3.1). Stakeholder concerns regarding review criteria are also addressed, including results from a survey to experts and panel members who have reviewed proposals for the RCN (Section 3.3).

The aim is to provide background information to the Research Council of Norway (RCN) and their ongoing efforts aiming at improving efficiency, quality and transparency in their funding instruments and operations. The present set of RCN funding instruments and criteria reflects the broad set of policy objectives and target groups of the agency. The RCN manages more than 100 funding schemes/programmes and has 17 grant types ('søknadstyper') applied across these schemes. The grant types define eligibility/who may apply, funding terms/demands for co-funding; expenses that may be covered, as well as the review criteria. There are multiple sets of review criteria: In total 41 'standardised' criteria. Each grant type applies 2-17 of these criteria. This diversity is larger than what we find in many of the other studied agencies.

The analysis identifies various ways in which funding agencies harmonise their instruments and review criteria across funding schemes, while still allowing for substantial tailoring of funding schemes. These solutions should be considered by the RCN in their current review of funding instruments and review criteria.

## **Large variety in structure and harmonisation of funding instruments**

Standardising grant types across funding schemes/programmes is one way of pursuing harmonisation and simplicity in funding instruments, while still operating a portfolio of funding schemes serving a broad scope of policy aims, target groups and needs. Among the studied funding agencies, Horizon 2020, the National Science Foundation (NSF) and the RCN have grant types used across funding schemes – in all cases providing overview and standardisation in a large and diversified set of funding instruments. Notably, the RCN has a large set of grant types, as well as a large residual/open category ('other support'), reducing the level of standardisation obtained compared to Horizon 2020 and the NSF.

The four other funding agencies included in the study have either a small number of funding schemes and no need of grant types across schemes (the ERC), or the terms and conditions are (more or less) common across funding schemes without (explicitly) being defined as standard grant types (VINNOVA; NWO – the Netherlands Organisation for Scientific Research; NERC – the Natural Environment Research Council).

### **Review criteria: Specified and clustered into a few main criteria**

Clustering the aspects to be assessed into a few overall criteria, seems more common than a detailed list of aspects/criteria to be assessed and rated separately. All the agencies in our limited sample have specified review criteria and guidelines for reviewers, but in most cases reviewers only rate the proposals according to 1-3 (main) criteria.

Most agencies operate with review criteria that in various ways cover most of the five general dimensions identified in this study: Originality; Feasibility/methods; Scientific and Broader Significance/impacts; the Applicant; the Research environment. In some cases, one review criterion (understood as what is rated separately) covers several dimensions, e.g. the single rate given to NSF proposals is to cover all five dimensions. In other agencies (with the exception of NERC's Discovery Science schemes), there are more separate rates, some covering one dimension, some covering multiple dimensions. ERC has one overall criterion (Excellence), which is rated separately for the proposed research and the applicant in the first stage of the review, and then given one overall rate by the panels. The only examples with multiple rates for one dimension are found in RCN. The RCN also has the highest number of separately rated criteria. The majority of the funding agencies operate with a limited number of standard review criteria across schemes, combined with some flexibility, in terms of different adaptations of the standard criteria (H2020, ERC and VINNOVA), or additional criteria (NERC and NSF), for some funding schemes/grant types.

Another concern is that separate rates for different aspects give the possibilities for more standardised ranking procedures, based on e.g. fixed rules for the relative weights of the criteria, and/or defined thresholds for each of them. Part of the differences between the agencies when it comes to review criteria, reflects different views on the benefits of such standardised procedures. NSF and NERC find that ranking based on averages of the scores on the different criteria in general makes little sense, as the rating scale is often used differently, and emphasise that the review comments are more important when ranking the proposals. In the H2020 (apart from ERC) on the other hand, standardisation and transparency are emphasised, and there are fixed weights and thresholds for each of the three criteria and fixed rules for ranking when multiple proposals end up with the same review score. Such standardisation implies less room for discretion in the review and presumably less time-consuming panel discussions.

### **Improving simplicity and flexibility in RCN grant types and criteria**

A key question for funding agencies with multiple and broad missions, like the RCN, is how to balance the need for customising funding instruments and review criteria to specific aims and target groups, with the need for simplicity and coherence as well as flexibility. Below we summarise challenges in RCN's grant types and review criteria, as well as possible solutions appearing from the comparative analysis.

#### *A smaller set of adaptable grant types*

The RCN operates with standardised grant types across its funding schemes. In general, when managing a large portfolio of funding schemes, standardised grant types across funding schemes ease administrative procedures, and provide better overview and clarity to applicants. Still for the RCN, with one third of proposals in a residual open category ('other support') as well as a considerable number of standard grant types, these kinds of benefits from grant types are more limited than in the other studied agencies. Possible ways to reduce the large proportion of 'other support', may include a smaller set of 'general' grant types which can be adapted to individual funding schemes and to the calls for proposals (e.g. by adjusting eligibility terms, funding requirements, and/or review

criteria). The ESF categories of funding instruments (Section 2.1.1.) may serve as a starting point when considering what needs to be a separate RCN grant type.

#### *Defining main review criteria*

The RCN operates with a highly differentiated set of review criteria, covering the various objectives of a large number of funding instruments, and transparency and simplicity seem limited. There are several challenges connected to the use of RCN's review criteria, some of which derive from the large set of customised criteria addressing partly overlapping aspects. For reviewers, it may be hard to decide which aspects belong under which criterion, and for applicants it may be difficult to understand which (of the many) criteria are most important. Our survey among experts who have reviewed RCN proposals shows large differences in the importance of the RCN review criteria: Some criteria are rated as highly important by the large majority of the reviewers, others only by a minority. When the reviewers are asked about the clarity of the criteria, much of the same pattern appears: The criteria which are found the most important are generally also the clearest, whereas those which are found less important are less clear. Still, most of the respondents find that the RCN criteria are as good as, or better than, those of other funding agencies they know, both in terms of importance and clarity. Their critical comments address overlapping and unimportant criteria.

A small set of fixed, general review criteria provides simplicity, overview and clarity in what is emphasised. Such criteria may be easier to apply for the reviewers, and the applicants may better understand the focus of the assessments. Conversely, fixed criteria limit the possibilities to ensure that all important aspects are assessed and may pose restrictions on the follow-up on programme objectives. Several agencies have solved this with a few main standard criteria, while adapting guidelines or sub-criteria to the individual funding schemes. Such cross-cutting, adaptable review criteria seem a simple, efficient and stable solution in several agencies, and should be considered by the RCN in their revision of review criteria, as a well-tested way to combine standardisation and flexibility.



# 1 Introduction

## 1.1 Background and RCN's challenges

A main task of research funding agencies is to design and operate funding schemes for research. In order to reach overall policy objectives, adequate funding instruments and review criteria are needed. In short, funding instruments and review criteria are key elements in how a funding agency operationalises policy objectives into funding decisions. In this work there is a need to ensure (1) adequate and clear eligibility and funding terms, as well as (2) adequate and clear criteria for selecting projects. Funding schemes/programmes have different aims and target groups, covering the needs for funding in e.g. different sectors, fields of research or at researchers' different career stages. Hence, there may be a great variety in eligibility and funding terms, as well as in criteria for selecting projects.

The Research Council of Norway (RCN) has an ongoing project with the aim of improving its processes. This includes increased *efficiency* (through e.g. simplifying, streamlining and standardising), increased *quality* (in terms of better fulfilling user demands and expectations) and increased *transparency* (in terms of clearer and better information about eligibility and funding terms, review criteria and processes). In this project, we address these issues with a particular focus on efficiency, simplicity, flexibility, customisation, clarity and transparency in funding instruments and review criteria.

### RCN grant types and review criteria

In the RCN, the need for adapting funding instruments to multiple policy objectives is reflected in:

1. a large portfolio of programmes/funding schemes, as well as multiple grant types ('søknadstyper')<sup>1</sup> used across funding schemes and programmes. The grant types define eligibility/who may apply, funding terms/demands for co-funding; expenses that may be covered, as well as the review criteria. In other words, they are different kinds of funding instruments.
2. multiple sets of review criteria varying according to grant type and also addressing scheme specific concerns (e.g. 'relevance to call' is often an additional criterion).

In total, RCN has 17 standardised types of grants (or different types of proposals) applied across the RCN funding schemes. The grant types comprise e.g. researcher projects, pre-projects, support for event and infrastructure grants awarded to research organisations, various kinds of personal fellowships, and innovation projects awarded to private companies or public sector (see full list in

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<sup>1</sup> In English, RCN denotes these 'application types'. The corresponding category in H2020 is 'type of action'. In this report, we use the term grant type or type of grant, see definition in Section 2.1.

Appendix 2)<sup>2</sup>. The high number of grant types partly reflects that RCN has a particularly broad mandate, being in charge of sponsoring research and research-driven innovation in all sectors and fields of research, and covers activities which in other countries are taken care of in different organisations. A common set up is to have separate agencies for support to i) research based innovation, ii) basic research and iii) applied research in specific fields and sectors. In Norway, all these functions are gathered in one organisation.

Hence, RCN needs funding instruments addressing a variety of different aims and needs. Still, from the surface, the RCN set of grant types<sup>3</sup> seem more complex (less simple) than what we find e.g. in Horizon 2020. Moreover, a substantial part<sup>4</sup> of the RCN applications are categorised as 'other support', which may indicate that the many standard grant types are too specialised and not sufficiently flexible to cover all RCN missions and objectives.

Moreover, some of the standard types of grants come with a long list of review criteria. In a recent NIFU review of methods and practices for assessing broader impacts of research in a selection of funding agencies, RCN prevails as the agency with the longest list of review criteria. In addition to RCN, the study included the National Science Foundation (NSF, USA), the Natural Environment Research Council (NERC, UK) and Horizon 2020. Whereas NSF and NERC have two overall review criteria each (NSF: 'Intellectual merit' and 'Broader impacts'; NERC: 'Excellence' and 'Fit to scheme'<sup>5</sup>), and Horizon 2020 has three criteria<sup>6</sup> ('Excellence', 'Impact' and 'Quality and efficiency of the implementation'), RCN has a substantially longer list of criteria (Langfeldt and Scordato 2015). Taking the RCN Researcher Projects and Innovation Projects for the Industrial Sector (IPN) as examples, the external reviewers are asked to assess proposals on 6 and 7 criteria respectively. For other types of grants the list of criteria vary from 2 (Personal Mobility Grant) to 17 (Research Infrastructures)<sup>7</sup>, as illustrated in Table 3.2.

The RCN funding instrument structure and grant types is described in Section 2.2 and the review criteria in Section 3.2.

### **Is the RCN set of grant types and review criteria adequate?**

Prior studies provide the RCN with divergent advice on these issues. A separate evaluation of the RCN grant type 'Knowledge-building Project for Industry' (KPN) found that some target groups have limited overview and understanding of the multitude of RCN grant types. On the other hand, the grant types provide a valuable toolbox for RCN – a set of standards to be used – when developing calls for proposals and formal documents/contracts (Damvad 2013). The KPN evaluation recommended a stronger clarity in the portfolio of grant types, either by restructuring the grant types into fewer/simpler categories or to improve the information to applicants.<sup>8</sup> Turning to the evaluation of RCN in 2012, we find that applicants generally found the access to, and the clarity of, call information satisfactory, and that the distinction between different grant types did 'not constitute an issue' (Mahieu et al. 2012, page 47). Moreover, it was concluded that 'RCN is overall in line with international practices in relation to its selection criteria' (Mahieu et al. 2012, page 77).

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<sup>2</sup> [http://www.forskingsradet.no/en/Application\\_types/1138882215869](http://www.forskingsradet.no/en/Application_types/1138882215869). Consulting the RCN project statistics for 2014, the picture is a bit more complex, including four 'other' categories: 'other support', 'other project support', 'other institutional support' or 'no application type'. <https://www.forskingsradet.no/prosjektbanken/>

<sup>3</sup> I.e. 'application types' in RCN language and 'types of action' in H2020 language.

<sup>4</sup> In the 2014 statistics, 27 percent of the projects are categorised as 'other support', 'other project support', 'other institutional support' or 'no application type'. Source: <https://www.forskingsradet.no/prosjektbanken/>

<sup>5</sup> In addition, 'Pathways to impact' are addressed in all schemes, but not rated. The pathway of impact description in the proposal needs to be acceptable before a grant is awarded, but it is (normally) not part of rating or ranking of the proposals.

<sup>6</sup> Not including proposals to ERC, where the sole criterion is scientific excellence (rated separately for the project and the principal investigator).

<sup>7</sup> These include RCN internal selection criteria.

<sup>8</sup> It was recommended to improve information either by providing clearer and better information about the application types, or making all information about applications types superfluous by fully integrating the needed information in the individual calls for proposals, Damvad 2013, p. 65-66).

## Research questions: Diversity, simplicity, transparency and customising

The overall topic of this report is the required degree of customisation of funding instruments and review criteria. How do funding agencies balance the need for customising funding instruments and review criteria to specific aims and target groups, with the need for simplicity and coherence as well as flexibility? How open are the funding instruments to individual tailoring on project and programme/call level, and how open are review criteria to the interpretation and adaptation of individual review panels? What are funding agencies', reviewers' and applicants' experiences and views on these issues?

In addressing these questions, we compare funding agencies regarding:

- *Portfolio and structure of funding instruments*: The degree of diversity in, and harmonisation between, funding schemes, calls for proposals and grant types/funding instruments.
- *Review criteria*: The diversity of review criteria, and the degree of clustering of aspects to be assessed into (fewer) overall criteria to be rated, vs. detailed lists of aspects to be assessed and rated separately.
- *Transparency and information*: How the set of funding instruments/grant types, funding terms and review criteria are communicated to applicants and reviewers, including the level of detail in reviewer guidelines and applicants' access to these guidelines.

## 1.2 Data sources and methods of the study

The study is based on multiple data sources:

- Literature review and previous studies
- Comparative study: Mapping of funding instruments and selection criteria in selected funding agencies
- Survey to RCN review panel members

### Literature review and previous studies

Based on a review of relevant academic literature and policy reports, we have summarised previously discussed issues and conclusions regarding funding instruments (Section 2.1) and review criteria (Section 3.1).

Moreover, the project summarises results from previous studies of reviewers' and applicants' experiences and views from RCN and other funding agencies, including researcher surveys for the evaluation of RCN in 2012; of FRIPRO in 2012; for the South-Eastern Norway Regional Health Authority in 2013, the Norwegian Cancer Society in 2015 and the Human Frontier Science Programme (HFSP) in 2006, and a researcher survey for the Swiss National Science Foundation (SNSF) in 2014.

### Comparative study

We have mapped funding instruments and selection criteria in six funding agencies:

- *The Research Council of Norway, RCN*: RCN is Norway's single national research funding agency, resulting from a merger of five national agencies in 1993. It covers all fields of research, and funding instruments for basic/independent research, strategic research/policy priorities, as well as innovation-oriented funding.
- *The Netherlands Organisation for Scientific Research, NWO*: NWO is the national research council and one of the largest science funders of the Netherlands. It operates under the remit of the Ministry of Education, Culture and Science. It funds both academic research, thematic/applied research and collaboration with industry, and is not too different from the RCN (still, much innovation-oriented research in the Netherlands is covered by STW<sup>9</sup>, not by NWO).

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<sup>9</sup> The Technology Foundation STW (<http://www.stw.nl/en>).

- *The National Science Foundation (US), NSF*: NSF is one of the major US research funding agencies, covering academic research across most areas of research (all fields of fundamental science and engineering, except for medical sciences). NSF also provides some funding directed at private sector/business, but this a small part of the NSF activity.
- *VINNOVA*: VINNOVA is Sweden's innovation agency and covers much of the same policy objectives and target groups as the innovation division of the RCN.
- *Natural Environment Research Council (UK), NERC*: NERC is one of the seven national UK research councils, covering academic and strategic research to help 'sustain and benefit from our natural resources, predict and respond to natural hazards and understand environmental change', as well as innovation projects.
- *Horizon 2020, H2020*: H2020 is EU's Research and Innovation programme, comprising all fields of research, and includes funding instruments for academic research/scientific excellence (ERC), strategic research/societal challenges, as well as innovation/industrial oriented projects. In the analysis, we map ERC and 'H2020 apart from ERC' as separate units.

Concerning 'comparability', it should be noted that the RCN has a considerably broader mandate than the organisations above, except Horizon 2020. Comparing complexity in all RCN funding instruments with those of NSF or NERC may seem unfair: NSF mainly provides funding for academic research<sup>10</sup> and NERC provides funding within specific domains and topics<sup>11</sup>. Comparing with the totality of H2020 grant types (including ERC grants), may provide a more adequate comparison.

*Data collection*: Information about the structure of funding instruments and grant types was retrieved from the webpages of the funding agencies. We also examined how this information was presented to applicants. Personnel in the respective funding agencies was contacted to clarify, supplement and verify the information available on the web sites, and draft texts were sent to the informants before finalising the report. With the RCN we had a face-to-face group interview, with ERC, NSF, NERC, NWO, and VINNOVA we had phone or Skype interviews and from Horizon 2020 we received written comments. In addition to responding to our preliminary text and clarifying specific issues, we asked about the funding agencies' experiences/evaluations and concerns as well as current discussions regarding funding instruments and review criteria.

### **Survey to RCN review panels members**

A survey to RCN review panels addressed their experiences and views regarding the RCN review criteria. The survey covered all panels which reviewed 'Researcher Projects' or 'Innovation Projects for the Industrial Sector' (IPN) or 'Knowledge-building Project for Industry' (KPN) in 2015. These are the three main RCN grant types, and they operate with clearly different sets of review criteria (see Table 3.3). The aim of the survey was to explore how the reviewers understand and use the criteria, and their views and experiences with the RCN criteria compared to those of other funding agencies they are familiar with.

*Survey sample*: In order to get a sample of experts with extensive experiences/solid basis for answering questions, we tried to avoid individual experts who have only reviewed 1 or 2 applications, but had to set a lower limit for the KPN and IPN than the FP reviewers in order to secure a sufficiently large sample of experts in these categories. Sample size and response rate is presented in Section 3.3, along with the survey results. The questionnaire is in Appendix 5.

<sup>10</sup> 81 per cent to HEI and 13 per cent to private industry in 2014. <http://www.nsf.gov/pubs/2015/nsf15004/nsf15004.pdf>

<sup>11</sup> NERC is one of seven national UK Research Council providing funding in different research areas.



## 2 Funding instruments: diversity, simplicity, transparency and customisation

### 2.1 Categories and previous studies

#### 2.1.1 Definitions and categories of funding instruments and types of grants

A research funding instrument can be defined as a way of distributing research funding with specified rules and requirements, and we may distinguish between different types of research funding instruments according to their rules, aims and requirements for funding. For competitive funding allocated by research funding agencies, these rules, aims and requirements may comprise the following aspects<sup>12</sup>:

- *Objectives and type of activities to be funded*: e.g. basic research, applied research, research-based innovation, inter/multidisciplinary research, thematic focus, breakthrough research, collaboration between institutions or between sectors.
- *Eligibility*: Target group/who may apply.
- *Type of expenses that may be covered and max budget*: e.g. payroll/personnel, fellowships, network measures, equipment and infrastructures, max number of PIs/project staff, max years of funding.
- *Selection and review criteria* (linked to objectives and type of activities to be funded).

Different types of funding instruments may be defined at (a) programme level (each funding scheme is a separate funding instrument), (b) proposal/grant level (each funding scheme may offer different types of funding, i.e. award a variety of grant types), or (c) for the individual call for proposals (there are a set of (annual or continuous) calls, each confined to different funding instruments). When such requirements are defined at proposal/grant level (b) and there is a set of standard ways of defining them across funding schemes/research programmes, this report refers to these standards as 'types of grant'. Furthermore, the rules/requirements may be defined at multiple levels, as done e.g. in the H2020 and in the RCN: there are standard types of grants applied across programmes and/or calls for

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<sup>12</sup> The European Peer Review Guide defines a funding instrument as 'An activity with the aim of distributing funding based on explicit requirements. These requirements are typically related to scientific focus, eligibility, competitive selection, etc. A funding organisation will normally make use of a number of instruments to meet its needs' (ESF 2011:79).

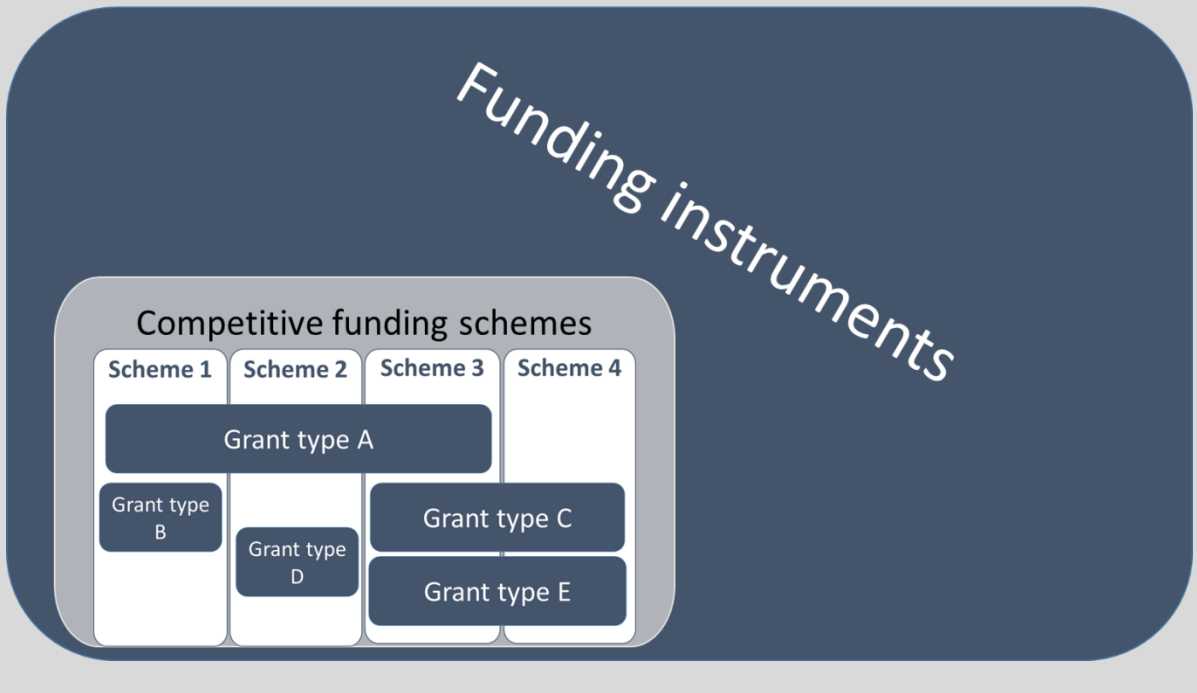
proposals and in addition the application requirements may be further specified and adjusted to the specific funding schemes and calls (see Section 2.2).

**Definitions**

*Research funding instrument:* A way of distributing research funding with defined rules and requirements. No standard categories exist. Categories may include both institutional funding (institutional/block grants; performance based funding), different types of competitive funding schemes and research programmes (see below), and funding types such as project grants, vouchers, stipends, R&D tax credits, loans, venture capital and R&D contracts.<sup>13</sup>

*(Competitive) Research funding scheme:* a funding instrument at programme/scheme level, e.g. thematic programme; scheme for independent projects/open mode funding; centres of excellence scheme; scheme for research-based innovation or knowledge transfer.

*Type of grant (as defined for this report):* a set of standard application requirements used across funding schemes/research programmes, i.e. a grant-level research funding instrument applied across funding schemes.



In previous studies and reports, we find a variety of categories of competitive research funding according to purpose, type of beneficiaries and activities. Leaving out the categories which are not based on competitive grants allocated by research funding agencies (e.g. institutional block grants, performance based funding, prizes and awards that are not based on review of project proposals), these categories distinguish between e.g. personal grants/fellowships, funding for research networks, research centres and infrastructures.

The categories are often defined in terms of funding schemes and general funding instruments rather than 'types of grants'. For example Poti and Reale (2007) distinguish between three main categories of project funding instruments according to the type of delegation from the funding agency to the

<sup>13</sup> <http://rhedi.universityworldnews.com/archives/public-research-funding-and-priority-setting/> and Jacob (undated); Kroll and Stahlecker 2012.

researchers: Free projects/grants ('blind delegation'/no restrictions on research topics)<sup>14</sup>, Programmes ('incentive delegation'/funding for defined policy priorities) and Networks (delegation to a network of research organisations/virtual centres).

The European Peer Review Guide outlines seven typical categories of funding instruments (ESF 2011:10):<sup>15</sup>

- Individual Research Projects (project grant to a single investigator or one research team)
- Career Developments Opportunities (e.g. doctoral training grants, postdoc fellowships, grants for the creation of independent research groups, advanced career grants, professorships/chairs)
- Collaborative Research Projects (funding for joint actions by research groups and if appropriate private actors, often interdisciplinary projects with multiple PIs)
- Creation or Enhancement of Scientific Networks (do not contain funding for the research itself, but for networking activities/meetings/events)
- Creation of Centres or Networks of Excellence (large long-term grants for establishing a centre or network/virtual centre within a common research topic)
- Creation or Enhancement of Research Infrastructures (funding 'dedicated to financing development, enhancement, maintenance and/or operation of research infrastructures')
- Knowledge Transfer and Dissemination Grants (funding 'dedicated to projects supporting the transfer of results from science to industry or other private/public sectors')

Yet another approach is to apply more general categories according to purpose, such as (1) 'Academic instruments' oriented at scientific results/publications/PhDs; (2) 'Thematic instruments' oriented at policy priorities; (3) Innovation instruments oriented at innovation and economic development in companies (Lepori et al. 2007:250).

In sum, the variety of types and levels of categories of funding instruments reflects a wide scope of aims, target groups and different needs and preferences concerning research funding. Each funding agency has its particular set of funding instruments and may have more than a hundred different funding schemes organised into a variety of categories. There is no standard way of categorising these instruments. The multitude of schemes and categories may imply challenges for the funding agencies in clearly and efficiently presenting and coordinating the funding schemes, and for the applicants to find the most relevant and adequate scheme to apply to.

### **2.1.2 Researchers' different needs and preferences for research funding, and the limited match between the economic and scholarly delimitations of research projects**

Studies of researchers' needs and motives to apply for RCN funding reveal a number of differences by research area and by type of RCN scheme, which confirms the need to have targeted funding instruments or general instruments covering a variety of different activities. For example, when applying for RCN funding, researchers within the engineering sciences are – as would be expected – particularly concerned about creating and strengthening collaboration with industry. On the other hand, researchers within the humanities seem more concerned – than those in other fields – about creating new research networks. (Appendix 1, Tables A1-A3).<sup>16</sup>

In addition to the types of activities covered by a funding instrument, differences in needs are related to project size. A large survey among researchers in Switzerland concluded that the time spent on one research topic or line of research varies considerably, from less than a year to more than ten years. Research lines are typically longer within fields such as biological sciences and basic medicine, and

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<sup>14</sup> The free projects are divided into subcategories corresponding to the RCN FRIPRO scheme (academic-oriented) and BIA scheme (innovation-oriented), Poti and Reale (2007:428).

<sup>15</sup> The list of typical funding instruments (ESF 2011) also comprises Major Prizes and Awards which is not included here.

<sup>16</sup> Still, motives are in many cases similar across sectors, see Tables 7.30 and 7.31 in Langfeldt 2012.

shorter within more applied fields of research (such as economics and business and ICT). Furthermore, the large majority of researchers (91 per cent in the Swiss survey) often or always work on different research lines in parallel. In addition, they often hold multiple grants for the same lines of research. Both parallel research lines and multiple grants for the same research lines most likely go along with being in charge of a larger research group and e.g. organising multiple PhD and postdoc projects (Langfeldt et al 2014).

In sum, this implies that funding agencies' different target groups (field of research/career stage/sector) have different needs and preferences concerning research funding, and that in general there is a limited match between researcher's grants and their lines of research. Research fields and research processes differ, and have different funding needs (Laudel and Gläser 2014). Moreover, the Swiss survey indicates that flexible funding instruments are appreciated, e.g. funding that covers a variety of activities (as lump sum funding) and different project sizes. More flexible/general funding instruments may increase the flexibility in designing research projects, and reduce administrative costs and the need for multiple grants for one project (Langfeldt et al. 2014).

### 2.1.3 Researchers' satisfaction with the RCN funding instruments/types of grants

Available survey data indicate that researchers in Norway are relatively satisfied with how they may spend their RCN funding, which is part of what defines different types of grants. The researchers, at least in the field of medical research, still express less satisfaction with RCN types of grants than with those of some alternative Norwegian funding sources. Concerning funding terms, Norwegian researchers consider that RCN are better than relevant international funding schemes when it comes to the flexibility of use of funds, but poorer when it comes to the amount of funding<sup>17</sup> (Langfeldt et al. 2012:14). Comparing results from three researcher surveys for different Norwegian funding schemes/agencies, we find that the studied RCN scheme (FRIPRO), obtain somewhat lower rates (than the two other studied agencies) from their applicants, when it comes to types and size of grants. Whereas successful applicants rated the FRIPRO grant types and grant size 3.5 on a scale from 1 to 5, the two other funding agencies were given average rates close to 4 from their successful applicants. The trend is partly the same for the rejected applications (table below). It should be noted that the two other agencies are both within medical research and are much smaller and more targeted funding agencies than the RCN. This may allow for better customised types of grant and more dedicated relations with target groups, and hence a group of generally more satisfied successful applicants.

**Table 2.1 Applicants' satisfaction with grant types and amounts. Data from three Norwegian surveys. Average of applicants' replies (1=not at all; 5=to a high extent) by funding status.**

| To what extent was the following satisfactory:<br><b>The types of applications and size of projects accepted</b><br>(in the call for proposals) | Applicants who<br><b>received</b><br><b>funding</b> | Applicants who<br><b>did not receive</b><br><b>funding</b> | <b>N</b> |
|---|---|--|----------|
| RCN FRIPRO applicants   | 3.5   | 3.0  | 718      |
| Southern and Eastern Norway Regional Health Authority   | 3.9   | 3.5  | 264      |
| The Norwegian Cancer Society  | 3.8   | 3.1  | 217      |

Sources: FRIPRO evaluation (Langfeldt et al 2012); evaluation of the Southern and Eastern Norway Regional Health Authority (Helse Sør-Øst RHF) allocation of research funding (Langfeldt et al. 2013); study of the Norwegian Cancer Society's allocation of research funds (Langfeldt et al. 2015). The same question was posed in all three surveys, with reply alternatives on a 5 point scale from 1 (not at all) to 5 (to a high extent). The Table shows average replies on this scale, not including the 'cannot say' replies.

Notably, researchers seem to have somewhat different perceptions on the RCN 'application types'<sup>18</sup> depending on the type of RCN scheme they have applied for. For instance, it appears that researchers

<sup>17</sup> Notably, on both questions a large proportion of respondents answer 'cannot say'. Comparing the groups of respondents who answer 'better' and those who answer 'poorer', there is still a substantially higher proportion which answers that the RCN is better than relevant international funding sources regarding flexibility of use of funds (Langfeldt 2012:14).

<sup>18</sup> The RCN term for grant type.

that have received funding from major schemes are more satisfied with the distinction between application types than are those who have received funding from other types of RCN schemes. At the same time, the latter group appears to be quite happy about the information in call texts which they consider to be clear and easy to understand (Appendix 1, Table A5 and A7, and Langfeldt et al. 2012:60). Hence, applicants may be satisfied with call information without necessarily understanding the differences between RCN's various types of grants.

#### **2.1.4 Main observations**

The following points summarise some main observations from previous studies on research funding instruments.

- The variety of types and levels of categories of funding instruments reflects a wide scope of aims, target groups and different needs and preferences concerning research funding.
- A multitude of funding schemes and categories may imply challenges for funding agencies in clearly and efficiently presenting and coordinating their funding schemes, and for the applicants to find the most relevant and adequate scheme.
- In general, funding agencies' different target groups (field of research/career stage/sector) have different needs and preferences concerning research funding, and there is a limited match between researchers' grants and their lines of research.
- More general/flexible funding instruments may increase the flexibility in designing research projects, and reduce administrative costs and the need for multiple grants for one project.

## **2.2 Structure and diversity of funding instruments in selected agencies**

In the following, we look at the structure of funding instruments in seven selected funding agencies. What kind of funding do they offer and how do they diversify and standardise terms and conditions across funding schemes?

The definitions in Section 2.1.1. and the categories of funding instruments outlined in the European Peer Review Guide provide basis for the mapping, see summary tables in Section 2.2.8. Information of the different profiles/tasks of the studied funding agencies is provided in Section 1.2.

### **2.2.1 The Research Council of Norway (RCN)**

*Grant types across funding schemes and calls:* As explained in Section 1.1, the RCN operate with a large set of types of grants applied across its funding schemes, and there may be joint or separate calls for proposals for each grant type under a funding scheme (the 17 different grant types are listed in Appendix 2). The different types of RCN grants<sup>19</sup> are defined in terms of objectives, what types of activities that can be funded/expenses covered/co-funding requirements, eligibility/who may apply and a set of review criteria. For example, 'Researcher Projects' may be applied by research organisations and cover payroll/personnel, fellowships, procurement of R&D services, network measures and equipment for a specific project. Another example is 'Innovation Project for the Industrial Sector' (IPN) which aims to stimulate R&D activity in trade and industry and may be applied by private companies, requires at least 50 per cent co-funding, but cover mainly the same types of expenses as 'Researcher Projects'. A broad range of different kinds of RCN programmes and funding schemes offer 'Researcher Projects', whereas IPN are offered by funding schemes for applied research and innovation and the RCN Large-Scale Programmes comprising both basic and applied research and innovation. When using the grants types within the separate funding schemes, objectives and review criteria, minimum and maximum size of grants may be further defined and differ between calls.

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<sup>19</sup> More precisely they are different types of proposals, denoted 'søknadstyper' in Norwegian and 'application types' in English.

Eligibility (who may apply as responsible institution) and (when relevant) terms for co-funding may not be redefined.

*Multiple levels of funding instruments categories:* The large number of RCN funding schemes and programmes are categorised along a variety of dimensions/levels. The categories used in the applications/project database and in the statistics include:<sup>20</sup>

- Level 1: Type of instrument ('Virkemiddel'), including four main categories (1) Programmes, (2) Independent projects, (3) Infrastructures and institutional measures, (4) Networking measures (these four categories are presented on the RCN website, some additional categories are used in the RCN database, e.g. diverse R&D related activities, and categories in the internal RCN budget).
- Level 2: Type of activity ('Hovedaktivitet'), a subcategory of type of instrument, including e.g. the different types of programmes (Large-scale programmes, user-directed programmes). There are 3-5 categories under each of the four main level 1 categories (in total 16). Example: Centre schemes is a subcategory under Infrastructures and institutional measures.
- Level 3: The individual funding schemes ('Aktivitet'), in January 2016 this included 122 schemes with a separate webpage. Example: Centre schemes include the SFF, SFI and FME schemes.
- Across: There are 17 grant types ('søknadstyper') applied across these categories and funding schemes. This includes a residual category 'Other support' which is an open category for which objectives, eligibility, review criteria etc. are defined and specified for the individual calls for proposals. Examples: All centre schemes are 'Other support'. 'Researcher projects' are found in all level 1 categories (including 27 per cent under 'Independent projects') and in a variety of different types of programmes (level 2).<sup>21</sup>

All these categories are, to some extent, *presented on the RCN website*. Information on the objectives, eligibility, review criteria etc. for the various grant types is easily available<sup>22</sup>, and call documents often refer to this general information. The level 1 categories are found under 'The Research Council' (not under 'applying for funding') presented as 'four main groups' of 'funding schemes for R&D projects'<sup>23</sup> and some information about the level 2 categories are given by clicking on the level 1 categories. However, the structure and level of categories are far from explicitly presented (and for some reason more clearly presented on the English than the Norwegian pages).

*The role of grant types:* The RCN grant types are a way of simplifying and streamlining the application and review process and the contractual terms. Each application type provides standardisation of documents such as the application and review forms, the guidelines to applicants and reviewers and the project contracts. Moreover, the grant type is one of multiple dimensions used in the grant statistics, providing information to the RCN and its stakeholders on the allocation of funds. It should be added that the role of the grant type is partly misleadingly presented at the RCN webpage, stating that 'Funding announcements for all Research Council programmes/activities are based on standardised application types with specified assessment criteria.'<sup>24</sup> As noted, about one third of all grants are in the 'Other support' category, for which review criteria, eligibility etc. is defined for the individual call.

*Ongoing process and concerns:* As noted in Chapter 1.1, there is an ongoing process in the RCN to improve and streamline processes. Despite the broad portfolio of grant types, a large part of RCN

<sup>20</sup> RCN 15. December 2015. 'Kodeplan 2015'.

<sup>21</sup> Including 38 percent in policy oriented programmes and 19 percent within large-scale programmes and 7 percent within user-directed innovation programmes (number of projects with funding in 2015)  
<https://www.forskingsradet.no/prosjektbanken>

<sup>22</sup> Grant types (named Applications types) is a subheading under 'Application information', among subheadings such as 'general application information' and 'application form'. When selecting 'Applications types' the applicant gets an overview of grant types, and information on objectives, eligibility, review criteria etc. is given when selecting a grant type.

<sup>23</sup> [http://www.forskingsradet.no/en/Funding\\_schemes/1138882212929](http://www.forskingsradet.no/en/Funding_schemes/1138882212929)

<sup>24</sup> [http://www.forskingsradet.no/en/Application\\_types/1138882215869](http://www.forskingsradet.no/en/Application_types/1138882215869)

grants does not fit any of the standard types, and an evaluation report found that some RCN target groups have limited understanding of the RCN grant types (Damvad 2013). Issues being discussed include revision/simplification of the grant types, e.g. by making them more flexible/open and reducing the need for the 'other support' category. Moreover, there is the option of not presenting the grant types to applicants, but retaining them as an (internal) toolbox and provide all needed information terms, conditions, forms and procedures for the individual calls, rather than linking to standard documents.

In sum, the RCN operate with a large set of standardised grant types across its funding schemes. The grant types provide harmonisation of terms, conditions and processes. The possibility of further streamlining of funding instruments is currently discussed, e.g. reducing the large number of grant types and/or the large residual category of 'other support'.

## **2.2.2 The Netherlands Organisation for Scientific Research (NWO)**

NWO is the Dutch national research council with a mission to 'strengthen and encourage quality and innovation in scientific research at Dutch universities and at national research institutes and to further the impact of science on society and the economy'.<sup>25</sup>

The NWO manages about 195 funding programmes<sup>26</sup>. It is currently organised in nine separate divisions which emerged from a merger of multiple independent funding foundations in the 1990ies. The large number of funding instruments reflects in part this organisational structure. The programmes are grouped into six broad categories named 'grant types':

- Programmatic
- Individual
- Cooperation and Exchange
- Investments
- Big Facilities
- Open Access

In addition, the funding instruments are categorised along six strategic objectives: *Curiosity driven research and talent, Collaboration in themes, Facilitating knowledge utilisation, International collaboration, High quality facilities and NWO's national role towards the institutes*. Moreover, several of the funding instruments are thematically oriented towards the nine economic top sectors identified by the Dutch government.<sup>27</sup> The funding instruments may be both individual funding schemes and used across programmes: They can be specific to an NWO division or a group of NWO divisions, or be NWO-wide.

One example is the 'Free competition scheme' that is offered by all NWO divisions and the conditions and scope may differ depending on the divisions. The Free competition scheme differs from programmatic funding instruments as the research theme is not defined. The Free competition scheme may be applied by senior researchers at universities and research institutes.<sup>28</sup> In volume, the Innovation Incentive Scheme is the largest NWO scheme, a talent programme awarding individual grant tailored to various phases in researchers' scientific careers (Veni, Vidi, Vici).

Cross-cutting grant types are used in demand driven research programmes, and may involve different types of public-private] cooperation (PPPs):

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<sup>25</sup> In 2014, NWO spent 767 million euros in total on research and research facilities.

<sup>26</sup> Including programmes that have had calls in the recent years but are now closed for funding <http://www.nwo.nl/onderzoek-en-resultaten/programmas>.

<sup>27</sup> The top sectors and related NWO themes are: Agri & Food, Chemistry, Creative Industry, Sustainable Energy, High tech, Logistics, Life Sciences & Health, Horticulture & Propagating Materials, Water and Climate.

<sup>28</sup> Free competition programmes exist in the Humanities, Physical Sciences, Earth and Life Sciences.

- Variant 1: 'Science takes initiative', may be applied by scientists with the support of partners in broad calls (top sectors) and requires a limited contribution (1-20 per cent, usually in-kind)
- Variant 2: 'Joint Initiative', may be applied by scientist and public/private partners and require a 10-40 per cent (in-kind and cash)
- Variant 3: 'Business takes initiative', may be applied by a company or a consortium of companies takes the initiative for a programme (related to a roadmap) and invests in the research together with NWO, requires 30-50 per cent contribution (in cash).

The grant types may also involve collaborations between private companies and knowledge institutions. For Example, the 'Knowledge Innovation Mapping' (KIEM) in particular addresses public-private co-operation of an SME and a University, or an SME and a University plus a University of applied Research. KIEM is also available for start-ups. KIEM is used across different domains, programmes, grant types and objectives (such as 'Creative Industry KIEM' (Individual) and Innovation Fund Chemistry KIEM (Programmatic)) and has its own assessment criteria (see Appendix 4 for the other schemes/grant types).

All categories of funding instruments and 'grant types' are presented on the NWO website. On the website there is a long list of active and closed calls (about 218 in March 2016) which can be filtered according to the six 'grant types', objectives and target groups. Specific details are presented for each funding instrument referring to the 'grant type', objective and assessment criteria and the NWO division responsible for its implementation.

In sum, the NWO operates with broad categories of funding instruments, some of which are used across all NWO divisions. Yet, most divisions develop instruments tailor-made for specific scientific discipline and purposes. The funding instruments (named 'grant types') are not presented as standardised grant types in the same sense as in e.g. the H2020 or RCN, but some of them still provide considerable standardisation across NWO divisions. Notably, information about target groups, eligible costs and criteria are presented in each individual call, and the nine divisions have a large degree of freedom/flexibility in adapting the funding instruments to their own objectives.

### **The 'new' NWO – Streamlining of funding instruments**

In April 2015, the NWO announced a new organisation model. The reorganisation (to be implemented as of 1 January 2017) will affect the governance structure and the current division structure with their associated funding instruments. The current nine divisions will merge into four domains.

The restructuring process will amongst others imply a harmonisation and streamlining of the current funding instruments. The changes originate in part from the need to align the funding instruments to the overall strategic objectives of the organisation. The increased attention on directing funding towards societal challenges has spurred the need to make programmes more flexible and responsive to interdisciplinary research. The evaluation of NWO from 2013 states that due to historical reasons, the NWO funding instruments were not adapted to fund research across disciplines, and recommended to restructure the funding instruments accordingly. This is as well in accordance with the experiences of the research community, which in general is satisfied with the functioning of the NWO funding instruments but regards some of them to be too narrow in terms of offering opportunities for interdisciplinary collaboration.

In practice, the NWO will maintain the current broad categories of 'grant types' but funding instruments will be streamlined, by reducing any unnecessary diversity of instruments and by making them more simple. This is based on the acknowledgement that the current portfolio of funding instruments is too fragmented. Funding instruments targeting the same type of research may take many different forms, without following a specific rational. The aim is to have the same type of funding in each of the domains. In sum, the purpose of the changes is not to restructure the funding instruments, but to achieve more simplicity by streamlining those who are creating unnecessary fragmentation.



The new structure will also be used when presenting the NWO activities to the research community. A new website will be launched in 2017, providing a more coherent presentation of the funding instruments.

According to the transition plan, NWO intends to develop ‘a basic palette of generic instruments’, which would ‘facilitate the accessibility of NWO as well as coherency for researchers’. The instruments are to be refined keeping scientific quality the primary criterion, while facilitating the work across disciplinary and domain boundaries, and ensuring the opportunity to respond to the diversity of scientific disciplines. The NWO domains are still to be free to realise their own emphases within the basic palette (Summary Action Plan NWO)<sup>29</sup>.

### **2.2.3 The National Science Foundation (US, NSF)**

The NSF is a major national US funding agency (see Section 1.2) and has more than 300 programmes. The programmes are categorised according to thematic/disciplinary programme areas<sup>30</sup>, as well as some main budget categories.<sup>31</sup> Other categories include ‘Crosscutting’ and ‘NSF-wide’ programmes and special programmes. The ‘Special’ programmes, include Small Business Programs and funding for Undergraduate Students, Graduate Students, Postdoctoral Fellows and K-12 Educators.

Across the NSF programmes there are both grant/award types and types of proposals, providing some standardisation of terms and conditions. The *types of proposals* define what may be funded and most of them are explained in the applicant guidelines, i.e. there are common instructions to applicants across programmes/calls. The types of proposals are:

- Standard (general terms for NSF proposals/no special type)
- *Rapid Response Research (RAPID)*: ‘The RAPID funding mechanism is used for proposals having a severe urgency with regard to availability of, or access to, data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events.’
- *EARly-concept Grants for Exploratory Research (EAGER)*: ‘The EAGER funding mechanism may be used to support exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. This work may be considered especially “high risk-high payoff” in the sense that it, for example, involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives. These exploratory proposals also may be submitted directly to an NSF program, but the EAGER mechanism should not be used for projects that are appropriate for submission as “regular” (i.e., non-EAGER) NSF proposals.’
- *Ideas Lab*: ‘The “Ideas Lab” is a funding mechanism designed to support the development and implementation of creative and innovative project ideas that have the potential to transform research paradigms and/or solve intractable problems. An Ideas Lab may be run independently, or in parallel, with the issuance of an NSF funding opportunity on the same topic. These project ideas typically will be high-risk/high-impact, as they represent new and unproven ideas, approaches and/or technologies. This mechanism was developed collaboratively within NSF, modeled on the “sandpit” workshops that are a key component of the United Kingdom Research Council’s “IDEAs Factory” program.’
- *Conference*: ‘NSF supports conferences in special areas of science and engineering that bring experts together to discuss recent research or education findings or to expose other researchers or students to new research and education techniques.’

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<sup>29</sup> Summary Action Plan Transition NWO. October 2015. <http://www.nwo.nl/en/about-nwo/organisation/new+nwo>

<sup>30</sup> Including: Biological Sciences; Computer and Information Science and Engineering; Education and Human Resources; Engineering; Geosciences; Mathematical and Physical Sciences; Social, Behavioral and Economic Sciences; International Science and Engineering, as well as Cross-cutting programs.

<sup>31</sup> The budget categories include: Research and Related Activities, Education and Human Resources, and Major Research Equipment and Facilities Construction.

- *Equipment*: Includes a separate proposal category under ‘Special Guidelines’ in the applicant guidelines. Equipment may also be applied as part of an ordinary research proposal.
- *International Travel*: ‘A university, professional society or other non-profit organization may apply for funds to enable it to coordinate and support US participation in one or more international scientific meeting(s) abroad.’
- *Facility/Center* (no general instructions/the guide ref. to programme/call): ‘Centers exploit opportunities in science, engineering and technology in which the complexity of the research problem(s) or the resources needed to solve the(se) problem(s) require the advantages of scope, scale, change, duration, equipment, facilities, and students that can only be provided by an academic research center. They focus on investigations at the frontiers of knowledge not normally attainable through individual investigations, at the interfaces of disciplines and/or by incorporating fresh approaches to the core of disciplines. Centers focus on integrative learning and discovery and demonstrate leadership in broadening participation through focused investments in a diverse set of partner organizations and individuals. In doing so, they draw upon, and contribute to, the development of the Nation’s full intellectual talent. Most Center awards are limited to a maximum duration of ten years and are often subject to mid-course external merit review.’
- *Fellowship*: There are no general instructions/terms for NSF fellowships proposals. The applicant guidelines refer to programme/call for proposals.

Whereas the types of proposals listed above concern what can be funded, the NSF *grant types* concern legal/contractual issues. Each call for proposals provide information on which grant types that may be awarded. The grant types/award types are defined on the website as follows:

- *Standard Grant*: ‘means a type of grant in which NSF agrees to provide a specific level of support for a specified period of time with no statement of NSF intent to provide additional future support without submission of another proposal.’
- *Continuing Grant*: ‘means a type of grant in which NSF agrees to provide a specific level of support for an initial specified period of time, usually a year, with a statement of intent to provide additional support of the project for additional periods, provided funds are available and the results achieved warrant further support.’
- *A Cooperative Agreement*: ‘means a legal instrument of financial assistance between NSF and recipient that [...] (1) Is used to enter into a relationship the principal purpose of which is to transfer anything of value from NSF to the recipient to carry out a public purpose authorized by a law of the United States [...]; (2) Is distinguished from a grant in that it provides for substantial involvement between NSF and the recipient in carrying out the activity contemplated by the NSF award.’
- *Fixed Award Amount*: ‘means a type of award in which NSF provides a specific level of support without regard to actual costs incurred under the award. This type of NSF award reduces some of the administrative burden and recordkeeping requirements for both the recipient and NSF. Accountability is based primarily on performance and results.’<sup>32</sup>

The award types result from government-wide rules on how to administrate public money and concern the legal framework for how awards are made. The distinction between standard and continuing grants is of little importance to the applicant: They apply for a grant – and the NSF issues it as a standard grant or a continuing grant depending on how the budgets are balanced between years.

The majority of the NSF programmes offers ‘Standard Grants’ and/or ‘Continuing grants’, and a substantial number of programmes offer ‘Cooperative agreements’ which normally are larger grants

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<sup>32</sup> <http://www.nsf.gov/pubs/policydocs/pappguide/nsf15001/>

and centres that are followed up by the NSF during the award term. 'Fixed Award Amount' is offered mainly by the Small Business Programmes (Appendix 4).

Both the grant and proposal types provide standardisation across the multitude of NSF programmes and calls for proposals. There is still substantial room for diversity and the tailoring of funding instruments for particular purposes, and individual programmes may include conditions that are defined in the relevant call for proposal/programme solicitation and not described elsewhere.<sup>33</sup>

The *proposal types* provide standards for how to handle different needs as well as guidelines for how people should apply, aiming at transparency and fairness to the research community (e.g. clear conditions for awarding funds without external peer review, as in RAPID or EAGER). They also aim at accountability, by defining routines for checks on how funds are spent (following up on the special conditions of the proposal type).

*Presentation to applicants:* The distinction between e.g. 'Standard Grants', 'Continuing grants', and 'Cooperative agreements' is relevant for administrating the awards, but of little relevance in the applications process. The individual researcher applying for NSF funding normally relate to the specific calls and the standard terms and conditions, not the award categories. Hence, there is little emphasis on explaining the structure of grant types to potential applicants. Of the grant/award/proposal types above, 'Standard Grant', 'Continuing Grant', 'Cooperation Agreement' and 'Fellowship' are presented as 'funding types' in the advanced funding search on the NSF website (searchable across programmes, see Appendix 4).<sup>34</sup> Apart from this, there is little overview of the various categories, and there is no general explanation of the distinction between grant types and types of proposals.

*In sum,* The NSF has a fixed set of proposal types used across schemes/programmes. These types of proposals define what may be funded and any deviations from the general terms and conditions and procedures. Ordinary NSF proposals (those without special conditions), confer to the general terms and conditions which apply across all schemes/programmes. This standardisation is combined with considerable flexibility when defining individual calls call proposals.

#### **2.2.4 VINNOVA (SE)**

VINNOVA is Sweden's innovation agency with the main task to provide funding for needs-driven research and to foster network building amongst public and private actors in the research and innovation system. Funding instruments are to a large extent designed to promote active participation of actors from the private, public and research sector in applications. Some of VINNOVA's programmes are managed in cooperation with other funding agencies, such as the Swedish Research Council, Formas or the Swedish Energy Agency.

In 2015 VINNOVA was responsible for managing and coordinating around 57 programmes.<sup>35</sup> These can be categorised according to the following three groups of programmes (list including subcategories in Appendix 4):

- *Thematic programmes:* Projects may be managed by different types of actors but it is a requirement that at least two of the following types of actors are included (in addition to lead users) research organisations, private companies and public entities. These programmes account for about 10 per cent of the VINNOVA's funding.
- *Capacity development programmes:* These programmes mainly target small and medium-sized companies, actors within the public sector as well as universities and colleges. The

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<sup>33</sup> For example the ABI programme (Advances in Biological Informatics), offer 'Innovation awards', 'Development awards' and 'Sustaining awards', defined in the programme solicitation: <http://www.nsf.gov/pubs/2015/nsf15582/nsf15582.htm>. Notably, these are not separate award types, the awards are issued as one of the ordinary NSF award types.

<sup>34</sup> [http://www.nsf.gov/funding/advanced\\_funding\\_search.jsp](http://www.nsf.gov/funding/advanced_funding_search.jsp)

<sup>35</sup> VINNOVA Annual report, 2015. [http://www.vinnova.se/upload/EPiStorePDF/vi\\_16\\_04.pdf](http://www.vinnova.se/upload/EPiStorePDF/vi_16_04.pdf)

projects may be managed by either individual actors or groups of actors (about 25 per cent of the VINNOVA budget).

- *Cooperation programmes*: These programmes require collaboration and pooling of resources of actors within different industries and knowledge areas. Programmes are designed to address challenge-based innovation, strategic innovation partnerships between industry, the public sector and academia. This activity line also includes VINNOVA's role of promoting Swedish participation in EU Framework Programmes (about 65 per cent of the VINNOVA budget).

A trend during the past five years has been a declining financial support to sectoral and thematic programmes in favour of more cooperation and bottom-up oriented initiatives. Compared to the past the agency now offers fewer and more targeted programmes with a long-term perspective, and a large part of its activities concentrate around three initiatives: The Strategic Innovation Programmes (SIPs), Challenge driven Innovation initiatives (UDI), and centre programmes (which currently corresponds to the VINN Excellence Centres and the Berzellii Centra).

The Strategic Innovation Programmes (SIPs) are the result of a bottom-up process in which the actors in the innovation community were invited to submit proposals for establishing and implementing programmes within strategic areas. A distinguishing feature of the SIPs is that they involve a broad range of actors, including universities, research institutes, public authorities, large companies and SMEs, and imply the transfer of managerial responsibility for the SIPs to the programme participants themselves (see Section 3.2.4). 16 SIPs were selected in 2015 and have been defined as 'mini-Vinnovas' (OECD, 2016). The programme model resembles that developed within the framework of the ERA NET schemes of the EU and the SHOK programmes in Finland (OECD, 2016). An important objective of the SIOs is to function as stepping stones for applying and participating in initiatives funded by the EU.<sup>36</sup>

A second key initiative is the Challenge-driven Innovation programme, with a different approach to management and implementation, and selection procedures than other VINNOVA programmes. The programme uses a stage-gate model comprising a three-stage process: for stage 1 the calls are open. For the other stages, only proposals from completed projects at the previous stage are accepted.<sup>37</sup> For Stage 2 projects, the upper limit of VINNOVA's contribution is SEK 10 million and the requirement is for at least equal funding from project partners (OECD, 2016).

Whereas there are no defined set of grant types across programmes, there are general terms and conditions that apply across schemes. All call texts refer to the VINNOVA's general terms and conditions for funding and describe the formal requirements, eligibility criteria, assessments criteria (with customised descriptions) and types of expenses covered. According to the general terms and condition, funding schemes may cover the following types of expenses:

- Support for research and innovation: fundamental research, industrial research, experimental development and feasibility studies.
- Investment support for research infrastructure: investment support for material and immaterial assets
- Innovation clusters
- Process innovation and innovation in organisations
- Innovation support exclusively to small and medium sized enterprises
- SMEs access to financing for start-up activities

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<sup>36</sup> The introduction of a stage-gate model to some of VINNOVA's programmes has as well partly come in response to the increased number of applications during past years. Important elements of this approach is that the first stage requires considerable less working load in the application phase compared to the subsequent stages, and the financial support is provided proportionally to the different stages.

The calls are announced on the agency's webpage and applicants can search for specific calls by selecting relevant target groups and domains.<sup>38</sup>

During last years, VINNOVA has experienced a significant increase in the number of project applications. The increase has come as a response to a strategic widening of the programmes to a larger number of actors. This situation has led the agency to rethink and create new ways to organise, including the way calls are organised and applications processed. The organisation has strived to achieve streamlined and simplified working methods across programme management division.<sup>39</sup> Programme management is now handled across the organisation in order to avoid fragmentation and facilitate internal staff mobility and internal learning. A main goal has been to increasingly appear more transparent, predictable and efficient towards VINNOVA's main target groups.

In sum, VINNOVA operates with a limited number of types of activity/groups of programmes with some common requirements, in addition to general terms and conditions across programmes, and so achieve harmonisation and standardisation without a defined set of 'grant types' across programmes. Streamlining and reduction in management workload is further sought by reduction of the number of programmes, more large/long-term funding, the introduction of closed calls (stage-gate model in some programmes), as well as internal staff mobility.

## **2.2.5 Natural Environment Research Council (UK, NERC)**

NERC funds independent research, training and innovation in environmental science. Funding is allocated through a number of Strategic programmes (around 60 current programmes in March 2016), as well as about 30 funding schemes for independent/discovery science, knowledge exchange, career development and equipment/ infrastructures (Appendix 4). On the NERC website the funding is categorised into seven different 'types of funding':

- *Strategic research*: strategically-directed towards research into a particular area or issue
- *Discovery science*: curiosity-driven/responsive mode research
- *Innovation funding*: knowledge exchange schemes, 'connecting researchers with those who can put their knowledge and skills to use, whether in industry, government or the third sector'. Innovation funding is announced in separate calls, but may also be available under NERC research programmes.
- *Postgraduate training*: Studentships and training grants to prepare for careers in academia and beyond. Funding opportunities are announced in separate calls, and also available under NERC research programmes.
- *Fellowships*: 'Funding to support outstanding environmental scientists and enable them to develop their research, start to build a research group and become internationally recognised.' Funding opportunities are announced in separate calls, and also available under NERC research programmes.
- *Capital funding*: Capital support for equipment, infrastructure, new technologies, facilities and estates.
- *NERC National Capability Commissioning*: Directly procured research and development activities to keep UK environmental science capability at the cutting edge (based in a need for 'critical mass of size and budget that makes direct procurement the only practical option'<sup>40</sup>).

For each of these types of funding, there are different funding schemes or types of grant awards/grants. For example, under Discovery science there are four types of research grants, each issued in different calls (see Appendix 4 for the schemes/grant types under the other types of funding):

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<sup>38</sup> The webpage is currently under reconstruction. The new structure will to a larger extent reflect the needs of the applicants and improve the user-friendliness of the interface.

<sup>39</sup> Annual report, 2015.

<sup>40</sup> <http://www.nerc.ac.uk/funding/available/nc-funding/>

- Standard Research Grant
- New Investigator Grant
- Large Grant
- Urgency Grant

There are no standard types used across programmes. Each programme (or call) define their objectives, funding levels and terms. Notably, the basic conditions are similar across all 7 UK Research Councils,<sup>41</sup> and (much) similar conditions apply for grants under e.g. NERC *Strategic research* and NERC *Discovery science*. Still there are always some additional conditions on programme grants, e.g. demands for specific activities and additional reporting.

The NERC website presents the funding structures explicitly to applicants. The structure of types of funding and subcategories are made clear to applicants in a clickable side-bar, showing where you are in the structure. The applicants are presented the overall structure of funding schemes and funding types, clearly distinguishing open/responsive funding mode, and a strategically oriented funding and innovation funding.

The present structure of NERC funding opportunities is developed as a result of multiple sources of input and past reviews<sup>42</sup>. There have been simplifications and reductions in the portfolio of schemes, as well as introduction of new initiatives (e.g. with international partners). In sum, there are continuous efforts to simplify and streamline the funding instruments and a parallel process adding new funding instruments to respond to new priorities and challenges. Presently there are discussions looking for opportunities for more standardisation, streamlining and simplification of NERC activities, as well as ensuring transparency and flexibility, and keeping strong relationship with the research community.

Likewise, ensuring diversity, flexibility and coherence in funding options is a topic in present discussions covering all seven Research Councils. A recent overall-level review of the UK Research Councils points to the need to ensure diversity in funding options. It is emphasised that funding mechanisms should be available for pilot, project and programme research support, for operating over a range of timescales, and be available for researchers at all stages of their career (Nurse 2015:18). Some of the other concerns in this report are to increase transparency and speed in the grant assessment process, and improve coherence (across councils) in the operation of grant panels. At the organisational level it is recommended to transform the present partnership 'Research Councils UK' into an organisation supporting the seven Research Councils collectively, including simplifying transactional operations, reducing administrative the burden, and taking the responsibility for cross-Council strategy (Nurse 2015).<sup>43</sup> The introduction of standard grant types across programmes/funding schemes does not seem to be part of the ongoing discussions.

In sum, NERC does not have standard grant types used across programmes. There is notable standardisation of grants and terms across NERC programmes and funding schemes, but not in terms of a set of announced grant types used across funding schemes. Concerns in ongoing discussions include opportunities for more standardisation, streamlining and simplification of NERC activities, as well as ensuring flexibility.

### **2.2.6 Horizon 2020 (apart from ERC)**

The European Commission provides funding to research and innovation through a variety of competitive funding schemes. In the current framework programme (Horizon 2020), the funding instruments are defined around three main 'pillars' with clearly defined objectives and types of

<sup>41</sup> <http://www.rcuk.ac.uk/funding/grantstcs/>

<sup>42</sup> E.g. the evaluation of NECR responsive mode in 2010

<http://www.nerc.ac.uk/about/perform/evaluation/evaluationreports/responsive-mode-report/>

<sup>43</sup> A Parliamentary Bill including this reorganisation has recently been published, see Part 3 in Higher Education and Research Bill 2016-17 <http://www.publications.parliament.uk/pa/bills/cbill/2016-2017/0004/17004.pdf>.

activities to be funded. The three funding instruments, 'Science Excellence', 'Industrial Leadership' and 'Societal Challenges', provide funding to a broad range of activities from basic research, applied research, research based innovation, thematic focus and collaboration between institutions and between sectors. The calls are announced in multiannual work programmes, which cover the large majority of funding available. The general annexes to the Horizon 2020 work programme describe general rules such as standard admissibility conditions and eligibility criteria, types of action, selection and award criteria. In comparison to previous FPs, Horizon 2020 has a more simplified list of possible types of actions. A novelty compared to FP7 consists of a streamlining of funding rates (e.g. research and innovation 100% and Innovation 70%). A novelty is also the introduction of a challenge based approach, implying less prescript and broader topics but a much higher emphasis on impact.

The framework programme offers nine different types of grant (or 'actions') which are applied across pillars and work programmes, and call announcements may include one or more grant types (the different grant types are listed in Appendix 4)<sup>44</sup>. The different types of Horizon 2020 grants are defined in terms of specific eligibility criteria for participation, type of activities funded (e.g. new knowledge, technology development, testing and prototyping, etc.), funding rate and specific review criteria. For example, 'Research and Innovation Actions' (RIA), must be applied by at least three independent legal entities and each established in a different EU member state or Horizon 2020 associated country. RIA actions primarily fund activities 'aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution'. These may include, 'basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment'. In addition, they may include limited demonstration and pilot activities.

A different type of grant, 'Coordination and Support Actions' (CSA), address primarily activities related to knowledge dissemination, networking awareness-raising, policy dialogue and coordination between programmes in different countries. CSA may be applied by one or more legal entities established in the EU or associated countries.

Funding for frontier research was introduced in FP7 with the establishment of the European Research Council (ERC). The ERC was extended under the 'Excellent Sciences pillar' of Horizon 2020. In addition to ERC, the excellence pillar also includes funding for research infrastructure, mobility and career development schemes (Marie Skłodowska-Curie actions, MSCA) and the Future and Emerging Technologies (FET) programme funding breakthrough research. MSCA is open to all domains of research, and to all research career stages. MSCA also address SME and industry. The five types of MSCA actions operates with standardised grant types which are unique to the MSCA programme but also with H2020 cross cutting grants such as the COFUND and the Coordination and Support actions.

Information about the funding structure and the rules for participation are provided on a specific website, and all necessary documentations for applicants are available on the Participant portal of Horizon 2020.

In sum, the H2020 has a well-defined set of grant types (named types of 'actions') used across its pillars and work programmes. These define eligibility, funding rate, review criteria and the kind of activities that may be funded. The function of crosscutting grant types is well established in the EU framework programmes and provide harmonisation, standardisation and simplification.

### **2.2.7 ERC**

The European Research Council (ERC) is established by the European Commission and belongs formally to the first pillar of the Horizon 2020 programme promoting "Excellent Science". The main purpose of the ERC is to support investigator driven research across all fields on the basis of scientific

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<sup>44</sup> Research and Innovation Actions (RIA), Cooperation and Support Actions (CSA), Innovation Actions (IA), SME instrument, ERA NET Cofund actions, Pre-commercial procurement, Public procurement of Innovative Solutions actions, European Joint (EJP) Programme Cofund actions.

excellence. ERC grants are open to applicants of any nationality without any restriction of country of residence but at the condition that the research must be conducted at a host institution established in an EU Member State or Associated Country.

The standard grant types (or “actions”) used across the other Horizon 2020 funding instruments are not applied in the ERC. In fact, the ERC operates with grant types which are specific for ERC only, namely: *Starting, Consolidator and Advanced Grants*. The grants are provided to research teams headed by a Principal Investigator. Since 2013, ERC also offers *Proof of Concept Grants* which gives further funding to work (i.e. activities which were not scheduled to be funded by the original ERC frontier research grant) related to the verification of the innovation potential of ideas arising from ERC funded projects. A condition for receiving a Proof of Concept Grant is therefore that proposals draw on previous ERC funded research. A single-stage submission and two-stage (single-step for Proof of Concept) evaluation procedure is used. The financial contribution takes the form of the reimbursement of up to 100 per cent of the total eligible and approved direct costs and of flat-rate financing of indirect costs on the basis of 25 per cent of the total eligible direct costs.

The ERC Work Programme, terms and conditions and information documents relevant for the calls are published on the ERC website. Table 2.2 presents the eligibility criteria and grant size of the four ERC grant types.

**Table 2.2 Eligibility criteria and size of ERC grants.**

|                                      | <b>Starting Grant</b>  | <b>Consolidator Grant</b>  | <b>Advanced Grant</b>  | <b>Proof of concept</b>   |
|--------------------------------------|--|--|--|---|
| <b>Specific eligibility criteria</b> | Principal Investigator shall have been awarded his/her first PhD $\geq 2$ and $\leq 7$ years | Principal Investigator shall have been awarded his/her first PhD $> 7$ and $\leq 12$ years | None (a track-record of significant research achievements in the last 10 years is expected). | All Principal Investigators in an ERC frontier research project, that is either on going or has ended less than 12 months before the opening date of the call |
| <b>Size and duration of grant</b>    | Up to a maximum of EUR 1 500 000 for a period of 5 years.                                    | Up to a maximum of EUR 2 000 000 for a period of 5 years.                                  | Up to a maximum of EUR 2 500 000 for a period of 5 years.                                    | Up to a maximum of EUR 150 000 for a period of 18 months.   |

In sum, the ERC has a simple structure and no need for crosscutting grant type. Each of its four grant types is a separate funding scheme.

### **2.2.8 Summary – comparative overview**

The mapped funding agencies cover much the same types of funding when categorised according to the ESF’s types of funding instruments (Table 2.3). In some cases, one instrument/grant type covers multiple categories (as the RCN Researcher Projects or the NERC Standard Grants). In particular, Collaborative Research Projects are in many cases not provided with a separate scheme or grant type. The collaborative projects (projects including multiple research organisation) seem often to be part of the same schemes or grant types as projects to one single organisation.



**Table 2.3 Types of funding offered (non-exhaustive list)**

| Type of funding (based on ESF 2011, see Section 2.1 above)                         | RCN  | NWO  | NSF <sup>3</sup>  | VINNOVA   | NERC  | H2020 (excl. ERC)  | ERC                                  |
|--|--|--|---|---|---|--|--------------------------------------|
| Individual Research Projects   | Researcher Projects  | TOP Grants, Free competition programme                           | Research proposal/Standard grant/Continuing grant                     |   | Standard grants; New Investigator Grant                             |  |                                      |
| Career Developments Opportunities  |  |  |   |   |   |  |                                      |
| <i>Doctoral Training Grants</i>  | Personal Doctoral Research Fellowship <sup>2</sup>   | Doctoral grant for teachers, PhDs in the Humanities              | Graduate Students Programs*/ Fellowships                              |   | Various grants, see Appendix 4.                                     | MSCA (various categories)  |                                      |
| <i>Postdoctoral Fellowships and Grants</i>   | Personal Post-doctoral Research Fellowship <sup>2</sup>  | Rubicon (mobility grant for postdocs)                            | Postdoctoral Fellows Programs*/ Fellowships                           |   | Independent Research Fellowships                                    |  |                                      |
| <i>Grants for the creation of Independent Research Groups</i>                      | Young research talents   | NWO Talent Scheme ( <i>Veni, Vidi</i> )                          | Faculty Early Career Development (CAREER) Program*/ SG/CG             |   | Independent Research Fellowships; New Investigator Grant            |  | Starting Grants; Consolidator Grants |
| <i>Advanced career grants</i>  | FRIPRO Toppforsk <sup>1</sup>  | Talent scheme <i>Vici</i>  |   |   | Independent Research Fellowships;                                   |  | Advanced Grants                      |
| <i>Other</i>   | 3 different kinds of personal mobility grants  | Talent programmes for women                                      |   | Personal mobility grants ('Mobility for Growth')  |   |  |                                      |
| Collaborative Research Projects  | Researcher Projects  | TOP Grants   | Same as for individual projects                                       | Strategic innovation programmes, Strategic Vehicle Research and Innovation (FFI),             | Standard grants <sup>5</sup> ; Large grants                         | Research and innovation action   |                                      |
| Creation or Enhancement of Scientific Networks (not funding the research activity) | (Support for events)   | Scientific meetings i.a., Gravitation programme <sup>6</sup>     | Research Coordination Network Grant                                   | VINNVÅXT (seminars, training and education)   |   |  |                                      |
| Creation of Centres or Networks of Excellence                                      | SFF, SFI, FME <sup>1</sup>   | Gravitation programme (inter-university collaboration)           | Support for Development of NSF Centers/ CA                            | Berzelii Centres <sup>7</sup> , VINN Excellence Centres                                       | (Large grants)  |  |                                      |
| Creation or Enhancement of Research Infrastructures                                | Research infrastructure  | Multiple schemes   | Multiple schemes  | Investment support for research infrastructure  |   |  |                                      |
| Knowledge Transfer and Dissemination Grants  | IPN, IPO, KPN (Forny; DEMO2000)  | KIEM, Take off, PPPs in thematic research <sup>8</sup>           | Small Business Programs/ Fixed amount award                           | Verification for growth, The Key Actors Programme, National mobility for innovation, VINNVÅXT | Innovation Projects; Follow-on Fund; Knowledge Exchange Fellowships | Innovation action; SME instrument  | Proof of Concept                     |
| Other: Types of funding not covered by above categories                            | <u>Grant types:</u> Pre-project; PES. <u>Not grant types:</u> Research Schools; Support for publication, STIM Open Access. | Incentive Fund Open Access, Graduate School, Graduate programme. | Long list of special/non-standard funding opportunities. <sup>4</sup> | I.a. Innovation Centres ('Idesslutar') and Test beds (for county councils and municipalities) | Urgency grants (proposal outside regular calls/deadlines)           | I.a. ERA-NET Cofund; Coordination & support actions; Joint Programme Cofund; |                                      |

<sup>1</sup> These kinds of grants are not defined as grant types, and counts as 'other support' in RCN. In total, about 1/3 of proposals are in the RCN 'other support' category.

<sup>2</sup> PhD and postdoc fellowship (non-personal) are also offered within Researcher Projects and other relevant grant types.

<sup>3</sup> The list is a mix of funding types (grant types (SG=Standard Grant; CG=Continuing Grant; CA=Cooperative Agreement) and types of proposals), and programme types dedicated for defined target groups. Programme types are marked\*.

<sup>4</sup> Special guidelines for applicants for: Grants for Rapid Response Research (RAPID); EARly-concept Grants for Exploratory Research (EAGER); Ideas Lab; Facilitation Awards for Scientists and Engineers with Disabilities (FASSED); Proposals for Equipment; Proposals Involving Vertebrate Animals; Proposals Involving Human Subjects; Proposals to Support International Travel.

<sup>5</sup> NERC also offers the possibility of joint proposals from different organisations and awarding funding directly to each of them.

<sup>6</sup> Consortia of universities may apply for funding covering new (and existing) personnel and material facilities; Investments in equipment/infrastructure and other facilities; management costs of the consortium for a maximum period of 10 years.

<sup>7</sup> Berzelii Centres are managed in cooperation with the Swedish Research Council.

<sup>8</sup> There are three types of Public-private partnerships.

In some cases, an agency may cover an 'ESF type' of funding instrument by one or more *funding schemes*, in other cases by a *grant type* used across funding schemes/programmes. For instance, the RCN 'Researcher project' is a grant type offered by multiple RCN funding schemes and programmes, whereas the NERC Standard grants is a separate funding scheme (both cover Individual Research Projects as well as Collaborative Research Projects). Moreover, the RCN funding for centres are separate schemes (SFF, SFI and FME), whereas the NSF centre funding is a type used across schemes.

In other words, the mapped funding agencies offer much the same categories of funding, but their funding instruments are structured differently (Table 2.4):

- The H2020 appears as the most 'structured' in the sense that there is a fixed set of grant types ('types of actions') consistently used in those pillars/sections of H2020 where they are relevant. The grant types are defined in terms of specific eligibility criteria for participation, type of activities funded, funding rate and specific review criteria.
- The NSF also has a fixed grant types used across schemes/programmes, but in a somewhat less explicit way than H2020. The large category of NSF ordinary proposals without special conditions, does not have a separate 'label'. It is simply a research proposal under general terms and conditions. The *types of proposals* define what may be funded and any deviations from the general terms and conditions and procedures. In addition to the types of proposals, the NSF has 'grant/award types' concerning legal/contractual issues of how awards are issued. Hence, the latter categories are of little importance to the application process.
- The RCN has a large set of grant types used across funding schemes/programmes, as well as a large residual/open category, and the ESF categories in Table 2.3 are covered by a mixture of grant types and funding schemes. Each grant type is defined in terms of objectives, what types of activities that can be funded/expenses covered/co-funding requirements, eligibility/who may apply and a set of review criteria. The system is flexible: When none of the standard categories fit the aims for a new call for proposals, terms and conditions for the funding is defined specifically for the call or scheme/programme and categorised as 'other support'.
- NERC, NWO, ERC and VINNOVA do not have standard grant types used across schemes. Each funding instrument is a separate scheme (as for the ERC grant types), and/or terms and conditions are (more or less) common across funding schemes without (explicitly) being defined as standard grant types (VINNOVA, NWO, NERC).

In sum, the mapping displays a variety of ways in which the agencies structure and standardise their funding instruments. They offer much the same types of funding. Still, some do this some with separate funding schemes and others with grant types across their funding schemes. The need and function of grant types across funding schemes is further discussed in Chapter 4.

**Table 2.4 Overview of funding instruments**

|                               | Funding scheme structure  | Funding instruments/project types   | Grant types across schemes?  | Communication of funding instruments/ project types  |
|-------------------------------|---|---|--|--|
| <b>NERC</b>                   | Types of funding <ul style="list-style-type: none"> <li>• Strategic research</li> <li>• Discovery science (responsive mode)</li> <li>• Innovation funding</li> <li>• Postgraduate training</li> <li>• Fellowships</li> <li>• Capital funding</li> <li>• National Capability Com.</li> </ul> | Different award types/funding schemes for each type of funding (list in appendix 4). Example: Types of grants under Discovery science: <ul style="list-style-type: none"> <li>• Standard Research Grant</li> <li>• New Investigator Grant</li> <li>• Large Grant</li> <li>• Urgency Grant</li> </ul>  | No. Each award type is a separate funding scheme. Common terms and conditions across schemes.  | Side-bar on website shows where you are in the structure of types of funding and subcategories.  |
| <b>NSF</b>                    | Categories include: thematic/disciplinary programme areas; 'Crosscutting' and 'NSF-wide' programmes and special programmes (such as Small Business Programs; Funding for Undergraduate Students; Graduate Students; Postdoctoral Fellows; K-12 Educators).                                  | <u>Types of (special) proposals:</u><br>Grants for Rapid Response Research (RAPID); EARly-concept Grants for Exploratory Research (EAGER); Ideas Lab; Facilitation Awards for Scientists and Engineers with Disabilities (FASSED); Centre/Facility; Equipment; Conferences; International Travel; Fellowship<br><u>Types of grants/awards:</u><br>Standard grant; Continuing grant; Cooperative Agreement; Fixed amount award   | Yes, both types of proposals and grants/ awards are used across schemes. Each scheme may offer multiple types.   | Common guidelines for proposals with separate sections for special proposals (special guidelines).   |
| <b>RCN</b>                    | Funding schemes categories: <ul style="list-style-type: none"> <li>• Research programmes</li> <li>• Large-scale programmes</li> <li>• Independent projects</li> <li>• Infrastructural and institutional measures</li> <li>• Centre schemes</li> <li>• Networking measures</li> </ul>        | 17 standardised grant types ('applications types') see Appendix 2. Supports a wide range of target groups. There are funding instruments for specific target groups, career stages, activities, project stages and sectors.   | Yes. A funding scheme/programme may include a variety of funding instruments, announced in the same or in different calls for proposals.   | Overview on website.   |
| <b>H2020 (apart from ERC)</b> | Three main pillars: <ul style="list-style-type: none"> <li>• Excellent Science</li> <li>• Industrial Leadership</li> <li>• Societal Challenges</li> </ul> Multiple individual work programmes under each pillar.  | Types of action: <ul style="list-style-type: none"> <li>• Research and innovation action;</li> <li>• Innovation action;</li> <li>• SME instrument</li> <li>• Coordination &amp; support actions</li> <li>• ERA-NET Cofund</li> <li>• Pre-commercial procurement Cofund</li> <li>• Public procurement of innovative solutions Cofund</li> <li>• European Joint Programme Cofund</li> <li>• MSCA (various categories)</li> </ul>  | Yes. A funding scheme/programme may include a variety of funding instruments, announced in the same or in different calls for proposals.   | Briefly explained in brochure: <a href="https://ec.europa.eu/progr/ammes/horizon2020/sites/horizon2020/files/H2020_inBrief_EN_FinalBAT.pdf">https://ec.europa.eu/progr/ammes/horizon2020/sites/horizon2020/files/H2020_inBrief_EN_FinalBAT.pdf</a><br>Templates and forms for each category available on website (proposal and reporting template, evaluation form). |
| <b>ERC</b>                    | Investigator-driven, frontier research. A limited number of funding schemes, directed at different target groups/career stages.   | Long-term funding for research talents/leaders: <ul style="list-style-type: none"> <li>• Starting Grants: 2-7 years after PhD.</li> <li>• Consolidator Grants 7-12 years after PhD.</li> <li>• Advanced Grants: for exceptional research leaders.</li> <li>• Proof of Concept: for bridging the gap between research and a marketable innovation, may be applied by PIs (recently) holding the above grants.</li> </ul>   | No. Each funding scheme consists of one grant type with call for proposals once a year.  | Clear overview on web site   |
| <b>NWO</b>                    | Types of funding schemes ('Grant types', each with numerous subcategories/calls): <ul style="list-style-type: none"> <li>• Programmatic</li> <li>• Individual</li> <li>• Cooperation and Exchange</li> <li>• Investments</li> <li>• Big facilities</li> <li>• Open access</li> </ul>        | Example of personal grants: The Innovational Research Incentives Scheme offers three types of grants: <ul style="list-style-type: none"> <li>• Veni: researchers recently obtained PhD</li> <li>• Vidi: obtained PhD last 8 years</li> <li>• Vici: for senior researchers</li> </ul> Different types of PPP collaborations in thematic research: <ul style="list-style-type: none"> <li>• Science takes initiative</li> <li>• Joint initiative</li> <li>• Business takes initiative</li> <li>• KIEM (targeting SMEs)</li> </ul> | Separate calls for each funding instrument/each funding scheme is a separate funding instrument/has its own funding instruments. But funding instruments are used across thematic fields/top sectors.<br><br>General regulations/ Terms and Conditions of Grants across the instruments. | Categories are explained at website but no systematic overview. Calls ('our funding instruments'), can be filtered according to the six 'grant types'. The definitions of grant types are included at the programme websites and in individual calls.  |
| <b>VINN-OVA</b>               | Categories of funding schemes <ul style="list-style-type: none"> <li>• Thematic programmes</li> <li>• Capacity development programmes</li> <li>• Cooperation programmes</li> </ul>  | There is a number of funding schemes within the categories on the left. Each scheme is a separate funding instrument. Examples:<br><u>Cooperation programmes:</u> <ul style="list-style-type: none"> <li>• Challenge-driven Innovation (UDI)</li> <li>• Strategic Partnership Innovation Programmes(SIPs)</li> </ul>  | No project types/funding instruments across programmes.<br><br>Common 'terms and conditions' for all grants.   | Categories of funding schemes on web site, but no overview of the total number of schemes/ instruments, apart from the current list of open and coming calls.  |

# 3 Review criteria in competitive funding schemes: diversity, simplicity, adaptability and transparency

## 3.1 Criteria in grant review – challenges and categories

### 3.1.1 *The role of criteria in peer review of grant proposals*

Research funding agencies set priorities for allocation of funds, and rely on a variety of concepts and definitions of research quality and relevance when implementing their policies. The agencies operationalize these concepts through their governance mechanisms, review forms and guidelines and depend on external expertise/peer review in assessing proposals for research (Lamont 2009; Langfeldt 1998). In this way, the concepts and criteria are interpreted and negotiated in the interactions between policy and the research community (Rip 1994; Meulen 1998; Guston 2000).

*Standardisation and tailoring:* In past decades, we have seen that grant review is becoming more standardised, including more detailed review forms and guidelines to reviewers. Empirical studies show that peer review is prone to different kinds of generic biases, it may disfavour e.g. interdisciplinary and non-conventional research (Luukkonen 2012; Lamont 2009; Langfeldt 2006; Laudel 2006; Chubin & Hackett 1990; Cicchetti 1991; Roy 1985; Cole et al. 1981), and funding agencies impose more standardised criteria and/or more detailed guidelines to better ensure that they achieve the objectives of their funding schemes. Increasing standardisation is also initiated to reduce randomness<sup>45</sup> and possible individual biases (that different reviewers emphasise different aspects in their assessments) in the review process. Standardisation and specification of review criteria, on the one hand, intend to ensure that all reviewers emphasis the same aspects when assessing the proposals and so increase the fairness and reliability of peer review (Lee 2015; NIH 2008). On the other hand, criteria are tailored to the aims and policy priorities of funding agencies and their various funding instruments.

*Increased focus on impacts and different approaches to specifying criteria:* A trend during the last decades is an increased focus on the assessments of potential societal impacts of research (Frodeman and Briggie 2012).<sup>46</sup> 'Broader impacts' have been a standard review criterion in the

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<sup>45</sup> E.g. randomness in the form of 'the luck of the reviewer draw' (Cole et al. 1981).

<sup>46</sup> In addition to societal impacts, there is increased policy emphasis on funding outstanding research and the research with the highest potential for scientific breakthroughs (Aksnes et al. 2012; OECD 2014).

National Science Foundation (US) since 1997, and since 2009 the Research Councils UK require a 'Pathway to impact' description from all their applicants (Langfeldt and Scordato 2015). Some hold that scientists 'tend by default to focus on scientific criteria in their judgements' (Nightingale and Scott 2007: 551), and the introduction of societal relevance and impact as separate review criteria can be seen as a way of ensuring that the review include assessments of such aspects (Langfeldt and Scordato 2015). This is particularly visible in the Horizon 2020 where the 'Impact' of proposals is rated separately (as are 'Excellence' and 'Quality and efficiency of the implementation') and a good score is required on each criterion for a proposal to be considered for funding. On the other hand, there are agencies which argue that it is hard to assess and compare impacts *ex ante* and they apply a more open and soft approach to incentivise broader impacts of research. This is the case for instance in the Natural Environment Research Council (UK, NERC), where impact is not a separate criterion: the 'Pathway to impact' of the proposals are commented on, but not rated by the reviewers<sup>47</sup> (Langfeldt and Scordato 2015).

In sum, there are different approaches concerning the specification of criteria. *Soft/open approaches* specify criteria on a general level, leave much discretion concerning the interpretation and weighting of criteria to the reviewers, and are often applied across different kinds of funding schemes. *Firm approaches* have more specified criteria and leave less to the discretion of the reviewers, e.g. by fixed minimum thresholds and weighting for each criterion (Langfeldt and Scordato 2015).

The literature does not give clear answers concerning the results/effects of, or need for, detailed review guidelines and criteria. There are indications that other aspects of the organisation of grant review – such as budget restrictions and rating scales – may be more important than the review guidelines for the kind of criteria emphasised by the reviewers (Langfeldt 2001). A study of the RCN in the 1990ies found that the review panels within the medical sciences were more focused on applicants' prior merits, whereas panels within the social sciences and humanities focused more on assessing the project description. However, according to their guidelines their emphases ought rather to have been the opposite (i.e. less emphasis on track record in the medical sciences than in the social sciences and humanities). The findings indicate some general differences between research fields in what is emphasised when assessing research proposals: 'harder' fields such a medical sciences put more emphasis on track record than 'softer' fields such as the social sciences and humanises. These differences were also found *within* the research areas – there were more emphasis on track record within economics than within other social sciences, more within basic medicine than within clinical medicine, and more within mathematics than within biology (Langfeldt 2001:827).

Moreover, guidelines regarding policy priorities when ranking proposals with the same rate (on research quality) may have limited importance. In the mentioned study of the RCN, guidelines regarding e.g. diversity and policy priorities varied between research areas, but these differences seemed to have limited impact on what was emphasized in the panel discussions. On the other hand, budget restriction and rating scales were found to substantially affect the room for considering diversity and policy concerns such as funding fields with special needs and promoting gender balance. With larger budgets (in terms of higher success rates) and a rough rating scale, the panels had more possibilities to take such issues into consideration, because there were more proposals with equal rates to be discussed within the budget of the call. Moreover, original and controversial projects seemed to have better chances in such situations (Langfeldt 2001).

Differences between disciplines' evaluative cultures and the importance of the group dynamics within review panels are confirmed in studies of other grant review processes (Lamont 2009; Arensbergen et al. 2014). Still, we lack general insight in the role of the review criteria in grant review. A recent review of studies of decision making in grant panels conclude that there is insufficient understanding of how the work of review panels impact the outcome of review and that more research is needed, e.g. to

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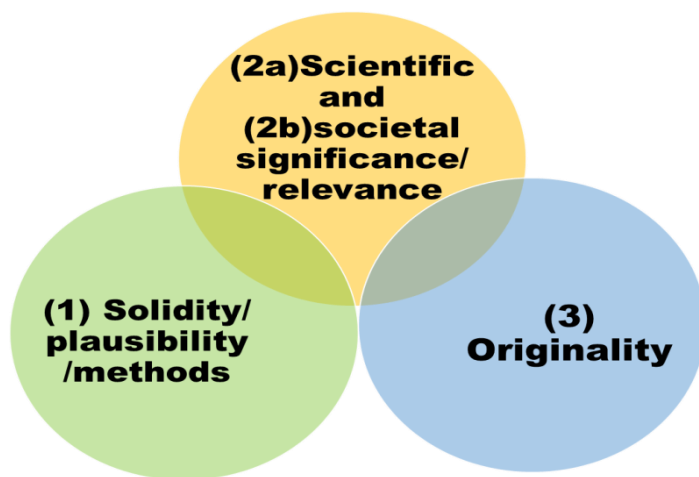
<sup>47</sup> However, NERC's 'Fit to scheme' criterion may include aspects around achieving boarder impacts.

study the implicit and explicit criteria used by panels, and compare with the formal specified review criteria (Arensbergen et al. 2014).

### 3.1.2 Defining quality and relevance of research – different aspects and emphasises

In empirical studies of researchers' *notions* of research quality, we find a multitude of quality aspects and much variety between fields of research (Bazeley 2010; Gulbrandsen 2000; Hemlin 1992; Hug et al. 2013; Lamont 2009; Mårtensson 2016). Still, there are some overall characteristics of good research across different fields of research, more or less deriving from the definition of science (Figure 3.1), as well as tensions between these aspects. Polanyi (1962) outlines the criteria of scientific merit under three overall headings: (1) plausibility, (2) scientific value and (3) originality. A Norwegian study of the concept of 'research quality' based on extensive literature review and interviews with merited senior researchers in ten fields of research, summarises into similar concepts while adding societal relevance for research with applied objectives: (1) solidity, and (2a) scientific and (2b) societal relevance, and (3) originality (Gulbrandsen 2000; Gulbrandsen and Langfeldt 1997).

Figure 3.1 Three general research quality criteria



A study of quality criteria in grant review, comes up with the same basic criteria referred to as (1) methods, (2) significance ((a) intellectual and/or (b) social), and (3) originality, and adds some criteria related to the context of grant review: (4) clarity<sup>48</sup> of the proposal and (5) feasibility of the project (Lamont 2009:167ff). *Feasibility* of the project is a criterion specific for assessing research that is not yet performed. Assessments of feasibility are often based on applicants' track record, project plans, resources etc., and linked to risk-taking, that is, the reviewers take into account the chances of the project to succeed and the funding agency's chances of getting value for money. Likewise, the *clarity* of a proposal can 'reveal competence' and a 'clear and orderly intellect', and so be an important indicator when assessing the competence of applicants (Lamont 2009: 168).<sup>49</sup>

From empirical studies, some differences in emphasis emerge across fields of research. For instance, more emphasis on societal relevance (in terms of practical applications) appear in engineering sciences (Gulbrandsen and Langfeldt 1997; Hemlin 1992), and different fields emphasise different kinds of solidity, e.g. the possibility of replication in experimental sciences, good/clear arguments in the humanities, and well-specified models in economics (Lamont 2009: 167; Gulbrandsen 2000:115;

<sup>48</sup> Note that this study encompasses humanities and social sciences, where clarity may appear as a more distinct evaluation criterion than in e.g. medial and natural sciences. Still, another study of the research quality concept encompassing a broad range of research areas, end up with clarity (specified as structured, understandable and readable) as an aspects of research quality separate from other aspects such as plausibility, originality and relevance (Mårtensson et al. 2016).

<sup>49</sup> Referring to Lamont (2009) Lee (2015:1276) focuses on novelty, methodological soundness and significance, and states that 'novelty promotes the discovery of new truths, methodological soundness assesses the likely truth of study conclusions by evaluating the reliability of data collection and analysis strategy and determinations of significance tell us which novel truths are most interesting or important'.

Hemlin 1992:15). Likewise, different aspects of originality are emphasized in different fields of research (Lamont 2009: 171-174; Gulbrandsen and Langfeldt 1997:87).<sup>50</sup>

Figure 3.1 indicates some overlap between solidity and originality on the one hand and scientific/social significance/relevance on the other. These aspects, in terms of bringing new and solid knowledge may be seen as a requirement for the scientific or societal significance and relevance of research. However, there are also tensions between the three set of criteria. Polanyi held that:

*'Both the criteria of plausibility and of scientific value tend to enforce conformity, while the value attached to originality encourages dissent. This internal tension is essential in guiding and motivating scientific work. The professional standards of science must impose a framework of discipline and at the same time encourage rebellion against it' (Polanyi 1962:3).*

In studying researchers' perceptions of such tensions, different opinions emerge. The tension between originality and scientific relevance may depend on how narrow/broad scientific relevance is defined, where a broad definition allows for more originality. And the relation between social relevance/utility and originality may depend on the kind of utility (utility for whom/when) pursued (Gulbrandsen 2000:111).

A study of reviewers' interpretation of the criteria for assessing proposals to the ERC, points out the tension between the perceived feasibility of the project at the one hand, and its originality at the other hand, as a key concern. Despite the aim of the ERC to promote ground-breaking research, the 'basic function of judging the value of proposed research against current knowledge boundaries' constraints the review process (Luukkonen 2012:58). In other words, there is an inherent tension between ground-breaking/highly original research and feasibility. Another study compared a set of funding schemes for ground-breaking research and grouped them into two categories: one group of schemes (including e.g. the Wellcome Trust Award for Innovative Research) was found to include riskiness as an important selection criterion, whereas the other group (including e.g. ERC Starting Grants) did not. And vice versa; the second group included leadership qualifications as an important selection criterion, the first group did not (Heinze 2008:314). In sum, funding schemes choose different ways of handling the tension between feasibility and originality, also when ground-breaking research is a main objective.

More generally, the *emphasis* on different aspects vary between context/the object of assessment. E.g. in assessing manuscripts submitted to scientific journals, significance and relevance for the audience of the particular journal may be the key criterion, whereas in assessing proposals for research projects the feasibility of performing the projects is normally emphasised.<sup>51</sup> Below we look at criteria proposed specifically for the selection of research priorities and projects.

### **3.1.3 Categories of criteria relevant for the review of proposals of research funding**

Criteria for assessing grant proposals differ from criteria for assessing e.g. manuscripts submitted to scientific journals or candidates for academic positions, in that the purpose is to assess research which is not yet performed. The aim is to select the research with the highest potential to fulfil the objectives specified by the funding agency. One of the first discussions of such criteria is found in Weinberg's paper 'Criteria for Scientific choice' in 1963. He outlines two sets of criteria for assessing research for the allocation of public funding, one set internal to science and one set of external criteria:

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<sup>50</sup> See also previous section concerning differences between hard and soft sciences in emphasising investigators' track record vs the project description, when assessing proposals for research grants.

<sup>51</sup> According to Lee (2015), these emphasises should be the other way around; there should be more emphasis on significance when assessing grant proposals, and more emphasis on methodological soundness/solid methods when assessing manuscripts for publication.

*Internal criteria/How well is the science done?*

- Is the field ready for exploitation?
- Are the scientists really competent?

*External criteria/Why pursue this particular science?*

- Technological merit: is the technology ripe for exploitation? Are the social goals attained, if the technology succeeds, themselves worthwhile?
- Scientific merit: Relevance to neighbouring fields of science
- Social merit: Relevance to human welfare and values of man.  
(summarised from Weinberg 1963:163-164).

Whereas Weinberg's internal criteria are focused on feasibility, the external criteria are focused on significance and relevance outside the research field. They are intended for setting policy priorities across research areas, rather than setting priorities within a research discipline, and they differ much from recommendations in recent policy reports concerning criteria for assessing research proposals.<sup>52</sup>

In contrast, the review criteria recommended by an NIH committee in 1996 focus on *significance* (both in terms of importance and originality) for the relevant area of research. Moreover, *solidity* is specified in terms of proper approaches and methods, and *feasibility* in terms of the experience, expertise and resources of the investigators and the research organisation (as elaborated for medical research):

1. 'Significance—the extent to which the project, if successfully carried out, will make an original and important contribution to biomedical and/or behavioral science
2. Approach—the extent to which the conceptual framework, design (including, as applicable, the selection of appropriate subject populations or animal models), methods, and analyses are properly developed, well-integrated, and appropriate to the aims of the project
3. Feasibility—the likelihood that the proposed work can be accomplished by the investigators, given their documented experience and expertise, past progress, preliminary data, requested and available resource, institutional commitment, and (if appropriate) documented access to special reagents or technologies and adequacy of plans for the recruitment and retention of subjects' (referred in NIH 2008:81).

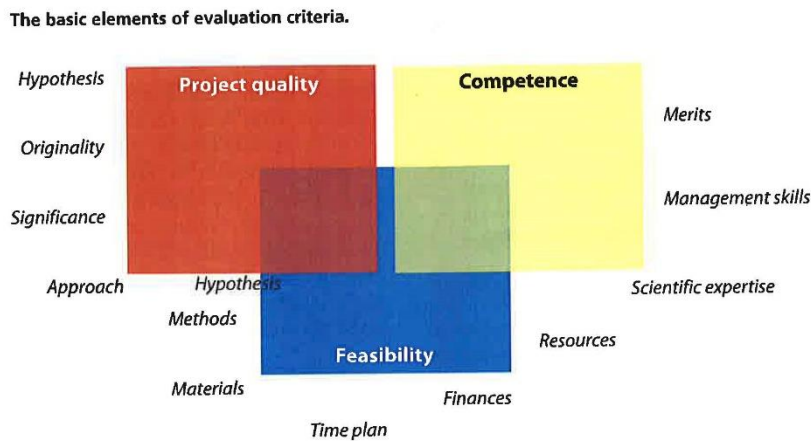
Looking at the criteria suggested in a NordForsk report on peer review 14 years later, we find these elements structured differently (Figure 3.2). There are three main criteria both in the 1996 NIH report and in the 2010 NordForsk report. Whereas *feasibility* is a main criteria in both reports, the NordForsk report combines significance and approach into the criterion '*Project quality*' and separates '*Competence*' as an individual criterion. At the same time, the figure in the NordForsk report explicitly recognises the overlap between the three main criteria, presenting feasibility as depending on both project quality and competence. Moreover, the NordForsk report adds aspects such as *managerial skills and time plan*, which are not included in the text from 1996. In sum, the way the elements are structured in the NordForsk report – not including the significance or originality of the proposed research as a separate criteria, may imply less weight on these elements and more weight on the possibility of carrying out the research.

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<sup>52</sup> We still find similar outlines in newer literature. Solesbury (1996) distinguish between 'Fitness for purpose' (i.e. feasibility/well done/ready for exploitation) and 'Knowledge added' (i.e. significance/merit). According to Ziman (1984:162), Weinberg's criteria are vague and not operative.



**Figure 3.2 Elements in assessing research proposals**



Source: NordForsk 2010, page 26.

Turning to the European Peer Review Guide, we find four main categories of evaluation criteria (ESF 2011, see Appendix 3):

- **Relevance and expected impacts** (driven by programme policy, strategy, mandates, etc., including broader impacts, requested resources, as well as ethical issues, environment and gender balance<sup>53</sup>)
- **Scientific quality** of the proposed research (including clear/compelling/thorough research, originality, appropriate research methods and feasibility)
- **Applicant** (qualifications and past achievements)
- **Research environment** (resources as personnel, facilities, infrastructures)

In this list, originality and feasibility are put in the same category (and named 'Scientific quality'), scientific significance is not a separate consideration (but may be so as part of 'relevance and expected impacts'), whereas the applicant and research environment are separate categories of criteria.

### **3.1.4 Balancing the need for simplicity/clarity and diversity/tailoring?**

As illustrated above, there is a multitude of elements and qualities which may be addressed when assessing grant proposals, and there are no standard way of structuring and setting up the review criteria. In summarising the above literature, we find two different dimensions, in terms of the elements and qualities to be assessed. The review may focus on assessing the proposed research, the applicants and/or the research environment (A, B and C in Table 3.1). Moreover, different qualities of these elements may be assessed: solidity, significance, originality, clarity, feasibility and/or compliance with general requirements (1-6 in Table 3.1).

<sup>53</sup> In Mårtensson et al. 2016 these aspects are given a separate category, 'Conforming' i.e. research that is regulatory aligned, ethical and sustainable (Mårtensson et al. 2016:600).

**Table 3.1 Main dimensions in assessing research proposals (subtracted/summarised from the sections above).**

| Elements to be assess      | Qualities to be assess  |
|----------------------------|---|
| A The proposed research    | (1) solidity/appropriateness of methods and approaches  |
| B The applicant            | (2a) scientific significance/relevance (broad relevance/significance for exiting knowledge base/science)  |
| C The research environment | (2b) societal significance/relevance (benefits/relevance to society/industry/users)   |
|                            | (3) original/ground-breaking/innovative research  |
|                            | (4) clarity (may be sub-category of 1 or 5)   |
|                            | (5) feasibility (competence, resources, likelihood of success, may be sub-category of 1)  |
|                            | (6) responding to/compliance with general requirements, including research ethics, diversity/gender balance, sustainability (may be sub-category of 2b) |

These elements and qualities may be structured in different ways into different sets of criteria. For example, reviewers may be asked to assess:

- the scientific quality (1, 2a and 3 in one joint criterion) and societal significance (2b) of the proposed research (A), and
- the competences (5) of the applicants (B),

or they may be asked to assess:

- the ground-breaking nature (3) and methods (1) of the proposed research (A), and
- the applicants' (B) track record for ground-breaking research (3) and
- the resources and dedication (5) of the research environment/organisation (C).

How may a funding agency best prioritise and specify these different elements and qualities into a workable set of review criteria? As shown below (Section 3.2), some agencies ask reviewers to give each proposal a single rate and provide them with a brief list of criteria and aspects that should be taken into consideration. Others provide reviewers with extensive review forms and ask them to rate a number of criteria separately. According to the European Peer Review Guide, *clarity* and *simplicity* is important. The guide emphasises that the criteria must be clearly drafted and easily applicable, and not include criteria that will not be strongly relevant and determining in the decision-making (i.e. one should not attempt to set up exhaustive criteria, ESF 2011:28). The need for simplicity and explicitly was also emphasised in an NIH report from 2008. The report recommended to standardise reviews, including individual rating of explicit criteria, while at the same time 'shortening reviews by focusing solely on scientific merit as presented' (NIH 2008:74).

The European Peer Review Guide also addresses the *diversity* of funding schemes and the need for adapting the review criteria to different types of funding scheme. For instance, in the case of postdoctoral fellowships/career development programmes, it is suggested to include the impact on career development as a review criterion, and in the case of collaborative programmes, it is suggested to assess the project leadership and management (ESF 2011 and Appendix 3).

On a more general level, a study comparing funding schemes in four European countries found that the typical criterion for assessing academic-oriented independent projects was 'scientific quality', whereas innovation-oriented grants were assessed on their economic/innovation potential and proposals to targeted programmes were assessed both on scientific quality, economic and scientific impact and relevance to the programme (Poti and Reale 2007:428).

Another concern is the possibility of counter-balancing possible reviewer biases, and ensuring that important criteria are properly emphasised. E.g. if one expects the review process to favour senior researchers, one may specify criteria that take into consideration the career stage of the applicants. Similarly, if one expects that too much weight is put on feasibility in a scheme attempting to fund

ground-breaking science one may ask reviewers to give separate rates for on the one hand ground-breaking nature/riskiness and on the other hand feasibility (Lee 2015:1278).

### 3.1.5 **Main observations**

The following bullet points summarise some main observations from the literature on grant review criteria:

- There are different approaches concerning the specification of criteria in peer review of grant proposals: criteria may be defined on a general level, leaving much discretion to the reviewers (and so criteria may be applied across funding schemes), or criteria may be more specified and tailored to specific funding schemes and their objectives.
- In the last decades, there has been increased emphasis on defining and specifying grant review criteria. There has also been an increased focus on *societal impacts* in the review of grant proposals, with a variety of different approaches for assessing such impacts.
- The literature does not give clear answers concerning the results/effects of, or need for, detailed review guidelines and criteria. Other aspects of the organisation of grant review – such as budget restrictions and rating scales – may have more importance for what is emphasised in review panels.
- While the definitions of research quality differ within the research community, there are nevertheless some common dimensions of research quality: Solidity/plausibility, scientific and societal relevance and originality. There is no standard way of setting up and structuring grant review criteria from such common dimensions. In defining criteria, there is a need to take into consideration both the need for simplicity and clarity for the reviewers and applicants, and the need for diversity and tailoring to specific funding schemes/aims and fields of research.

## 3.2 **Review criteria in selected funding agencies**

In this section, we study the review criteria in the selected funding agencies. To what extent do they apply standard criteria across funding schemes? How are concerns for diversity, simplicity, transparency and customising of criteria taken care of?

The categories in Section 3.1.4. provide basis for the mapping, see summary tables in Section 3.2.8.

### 3.2.1 **The Research Council of Norway (RCN)**

Different from the other mapped agencies, the RCN operate with a large number of standardised review criteria. The main characteristics are:

- *Multiple sets of standard criteria that may be modified to fit individual calls for proposals:* As explained in Chapter 1, each of the RCN standardised grant types comes with a list of review criteria which may be elaborated/modified in the call for proposals. Table 3.3 lists the criteria for three major types of grants, Appendix 2 summarises criteria for all grant types and Table 3.2 summarises the number of criteria by grant type and type of criteria.
- *Different sets of criteria for external and internal review, and general checkpoints/selection criteria across all grant types:* For some of the RCN grant types, the list of criteria also include aspects to be assessed by the programme board and/or RCN staff, as illustrated for IPN and KPN in Table 3.3. In addition to the review criteria, RCN apply some selection criteria/check points across the various types of proposals (as ethical standards, gender balance and impacts on the natural environment). These aspects may be assessed by the review panel and/or the programme board/by RCN staff.<sup>54</sup>

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<sup>54</sup> For IPN, RCN staff assess these aspects, whereas for e.g. Researcher projects the review panel is asked to comment on 'Any ethical problem, negative environmental impact or, when relevant, lack of gender perspective in the ranked applications' (mandate and guidelines for referee panels for independent projects 2015).

## Aspects covered by the criteria

The aspects covered by the RCN review criteria vary by type of grant (Table 3.2). For some of the grant types, the aspects identified in Section 3.1 are covered by multiple criteria (that is, sub-aspects are rated individually), whereas other aspects are not explicitly assessed or rated. Moreover, some of the RCN criteria cover multiple aspects. An example of the latter is the general scientific quality criterion, named 'Scientific merit' which is applied for seven of the grant types. This criterion covers originality, feasibility/approach/methods/ clarity and (implicitly in terms of knowledge about the research front) scientific relevance/significance:

*'Originality in the form of scientific innovation and/or the development of new knowledge. Whether the research questions, hypotheses and objectives have been clearly and adequately specified. The strength of the theoretical approach, operationalisation and use of scientific methods. Documented knowledge about the research front. The degree to which the scientific basis of the project is realistic. The scientific scope in terms of a multi- and interdisciplinary approach, when relevant' (text in guide to RCN reviewers and applicants).*

Relevance or expected impact is an example of an aspect covered by several criteria. For IPN applications, reviewers are asked to rate three relevance/impact criteria separately. In addition, there are four criteria for the programme board/internal review covering this aspect:

### *External/panel review*

- 'Potential for value creation for industrial partners'
- 'Level of innovation' (i.e. significance of the innovation in relation to the 'state-of-the-art' in a field)
- 'Level of research' (i.e. significance for the scientific development/research front)

*Internal RCN review criteria* (assessed by the programme board/RCN staff and may also be assessed by the panel)

- 'Relevance of the research for innovation' (i.e. assessing how important the research is for realisation of the innovation)
- 'Dissemination and communication of results' (i.e. plans for ensuring dissemination/publication/importance for users)
- 'Other socio-economic benefits'
- Relevance relative to the call for proposals

In sum, there is a limited match between RCN review criteria and the main dimensions in assessing research proposals identified in Section 3.1. All main dimensions are covered in the RCN criteria, and the main dimensions cover nearly<sup>55</sup> all aspects addressed by the RCN criteria. Still, several criteria address multiple dimensions and there are several criteria addressing each dimension.

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<sup>55</sup> The two exceptions are 'Additionality' (the extent to which the RCN funding will give activities and efforts that would otherwise not have been realised) and 'National cooperation' (make use of national research expertise and promote national network building). These two criteria concern spending public money wisely, and could be categorised under boarder/social significance/expected impacts.

**Table 3.2 RCN review criteria rated by external reviewers/panels (and RCN staff/internal review), number of criteria by grant type and category**

| Grant type                                     | Proposed research  |                  |                           |                            | Applicant | Research environment | Other                    | Sum criteria (internal) | Over-all rate |
|--|--------------------|------------------|---------------------------|----------------------------|-----------|----------------------|--------------------------|-------------------------|---------------|
|  | Scientific quality | Originality/risk | Feasibility (and clarity) | Relevance/expected impacts |           |                      |                          |                         |               |
| Researcher project                             | 1                  | [1*]             | 1                         | 2                          | 1         | 1                    | 1 National cooperation   | 7                       | 1             |
| Young Research Talents                         | 1                  | 1                | 1                         | 1 (1)                      | 2         | 1                    | (1 National cooperation) | 9 (2)                   | 1             |
| IPN  |                    | (1)              | 2 (1)                     | 3 (4)                      | 1         | (1)                  | (1 Additionality)        | 14 (8)                  | No            |
| Innovation Project for the Public Sector (IPO) |                    | (1)              | 2 (1)                     | 3 (4)                      | 1         | (1)                  | (1 Additionality)        | 14 (8)                  | No            |
| KPN  | 1                  |                  | 1 (1)                     | 1 (5)                      | 1         | (3)                  |                          | 13 (9)                  | 1             |
| Research Institution-based Strategic Project** | 1                  |                  | 1                         | 4                          | 1         | 2                    | 1 National cooperation   | 11                      | 1             |
| Research infrastructure                        |                    |                  | (4)                       | (5)                        | (2)       | (1)                  | (5)                      | (17)                    | 1             |
| Personal Doctoral Research Fellowship          | 1                  |                  | 1                         | 2                          | 1         | 1                    | 1 National cooperation   | 7                       | 1             |
| Personal Post-doctoral Research Fellowship     | 1                  |                  | 1                         | 2                          | 1         | 1                    | 1 National cooperation   | 7                       | 1             |
| Personal Visiting Researcher Grant             |                    |                  | 1                         | 2                          | 1         |                      |                          | 4                       | No            |
| Personal Overseas Research Grant               |                    |                  | 1                         | 2                          | 1         |                      |                          | 4                       | No            |
| Personal Mobility Grant                        | 1                  |                  |                           |                            | 1         |                      |                          | 2                       | 1             |
| Support for Events*                            |                    |                  |                           | 2                          |           | 1                    | 1 National cooperation   | 4                       | No            |

Non-covered types of grants and criteria: The list does not include the general selection criteria/check points across applications types (Table 3.3).

The table does not include grant types without standard criteria (such as 'Other Support' or 'Pre-project'), or grant types without the status of 'Application type' (e.g. centre grants and ToppForsk, see note to Table 2.2).

\*'Boldness' is a criterion for FRIPRO Researcher projects, but not included in the standard review criteria for Researcher projects.

\*\*No info on panel vs. internal criteria.

## The presentation of criteria to applicants and reviewers

The different sets of review criteria are listed at the RCN website, without any distinction between those who are reviewed by external reviewers and those for internal review. The review criteria are listed and explained on the page describing the various grant types, and the individual calls for proposals normally refers to this information concerning review criteria. Some funding schemes also have a general overview and explication of criteria on their webpage (e.g. FRIPRO), and the call refers to this information rather than the general terms and criteria of the grant type. The general RCN webpage explaining the review process lists no criteria, but refers to the call for proposals and the type of grant when it comes to review criteria.<sup>56</sup>

The explication of review criteria in the guidelines to reviewers/the review form contains the same text as presented to the applicants. The additional information given the reviewers (the text not generally available to applicants)<sup>57</sup>, includes instructions for how to use the rating scale, what criteria are assessed at the different stages of review, and further details of the review process. The instructions for the use of the rating scale include a description of the defining characteristics of the different marks, as exemplified in Appendix 2, Table A18.

<sup>56</sup> Moreover, the review process vary substantially between e.g. Researcher Projects and Innovation Projects for the Industrial Sector, still such differences are not noted in RCN's general description of its application types ([http://www.forskningsradet.no/en/Application\\_types/1138882215869](http://www.forskningsradet.no/en/Application_types/1138882215869)) or in the general description of the review process (<http://www.forskningsradet.no/no/Soknadsbehandling/1183468209195>).

<sup>57</sup> The review form is not generally available at the RCN website, under neither the grant types, nor the individual calls. Even if not provided to potential applicants searching through RCN calls, some of the information provided to reviewers is stored on the RCN website and can be found in a Google search. For some funding schemes (as the FRIPRO scheme), applicants are provided with more extensive information about the review process and a link to the mandate for the review panels.

**Table 3.3 Examples of RCN Review criteria: Criteria for RCN Researcher Projects, Knowledge-building Project for Industry and Innovation Projects for the Industrial Sector**

| Researcher projects (FP)  | Knowledge-building Project for Industry (KPN)  | Innovation Projects for the Industrial Sector (IPN)   |
|---|--|---|
| <i>External experts/panel review</i><br>a) Scientific merit<br>b) Project management and the Project group<br>c) Implementation plan and resource parameters<br>d) National cooperation<br>e) International cooperation<br>f) Dissemination and communication of results<br>g) Relevance relative to the call for proposals | <i>External experts/panel review</i><br>a) Level of research<br>b) Scientific merit<br>c) The project manager and project group<br>d) Implementation plan and resource parameters<br><i>By programme board/internal RCN criteria</i><br>e) Benefits for the national knowledge base<br>f) Relevance and benefit to trade and industry<br>g) Strategic basis and importance<br>h) User participation<br>i) Quality of the application documents<br>j) Other socio-economic benefits<br>k) International cooperation<br>l) Dissemination and communication of results<br>m) Relevance relative to the call for proposals | <i>External/panel review</i><br>a) Level of innovation<br>b) Potential for value creation for industrial partners<br>c) Realisation of the innovation<br>d) Level of research<br>e) R&D project quality<br>f) Implementation capacity<br><i>Internal RCN review criteria (may also be assessed by the panel)</i><br>g) Relevance of the research for innovation<br>h) Other socio-economic benefits<br>i) Additionality<br>j) Quality of the application documents<br>k) R&D-related risk<br>l) International cooperation<br>m) Dissemination and communication of results<br>n) Relevance relative to the call for proposals |
| <i>Additional check points/selection criteria across grant types</i><br>Ethical perspectives<br>Environmental impact<br>Recruitment of women<br>Gender balance in the project<br>Gender perspectives in the research<br>Internationalisation  |  |   |

Source: [http://www.forskningsradet.no/en/Application\\_types/1138882215869](http://www.forskningsradet.no/en/Application_types/1138882215869), supplemented with direct information/email from RCN. Criteria for all RCN types of grants ('søknadstyper') in Appendix 2.

### Overall concerns and issues raised in relevant evaluations and studies

One of the concerns in defining the RCN review criteria has been standardising across calls/schemes. Most of the criteria are general, applying to multiple research areas and types of funding. The standard sets of review criteria across funding schemes and calls simplify administrative procedures, and researchers applying to – and experts/panel members serving – multiple funding schemes get accustomed to the criteria. The purpose of asking reviewers to rate/assess a number of criteria individually is to get more standardised and detailed information in the reviewers' assessments/reports. For some grant types, this may give separate rates for a large number of criteria. At the same time, transparency and simplicity are limited. The RCN handle a highly differentiated set of review criteria, covering the various objectives of a large number of funding instruments. To some extent, different aspects are clustered into one criteria/mark. Still, for most grant types a considerable number of criteria – which may address some of the same aspects – are to be rated (Table 3.2). Moreover, most criteria are further elaborated along a 7-point rating scale (example in Appendix 2, Table A18). Hence, the review forms can be quite complex, limiting clarity and simplicity for the reviewers. Transparency and simplicity for applicants are also limited, as there are long lists of criteria not explaining/emphasising the main concerns, or explaining which criteria are rated at the different stages of the review process, and there is no easy access to the review form or information about how the criteria are elaborated in the descriptions of rating scales.

As mentioned in Section 1.1, the RCN prevails with the longest list of review criteria in a recent comparative study (Langfeldt and Scordato 2015). In the surveys for the last evaluation of the RCN (Langfeldt et al 2012b) and an evaluation of FRIPRO (Langfeldt et al 2012a) there were no questions

addressing review criteria specifically. However, in their free text replies a few (in total 14) respondents addressed the review criteria<sup>58</sup>. Most of these were concerned that RCN (a) had too many criteria and that there should be clearer focus in the review of proposals, (b) that criteria were unclear/there was little transparency in the basis for review, and/or (c) that there were too much focus on factors that should not be major concerns in the review (such as Norwegian relevance and collaboration). One FRIPRO applicant stated that 'expert panels seem to put equal weight on important and irrelevant factors'.<sup>59</sup> These comments may be interpreted as though the considerable number of criteria, and lacking information on how they are weighted/their role in the different phases of the review process, is a source of discontent among applicants who would like more transparency in the review and more focus on what they consider the most important criteria. Moreover, concerning the weight on different criteria, the FRIPRO survey indicated that the applicants thought the review process is better at assessing feasibility than originality.<sup>60</sup>

A RCN survey to reviewers for the BIA scheme, indicated that in reviewing IPN applications, the reviewers found the criteria addressing 'Potential for value creation for industrial partners' and 'Realisation of the innovation' a bit more difficult to assess than the other criteria. All criteria scored at least 3.8 (out of 6) on 'easy to use' (highest score was 4.4 to 'R&D project quality'). In their open comments, four reviewers emphasised that the criteria are too similar or unclear/that they should be better described (RCN 2015, unpublished). In Section 3.3 we present the results of a new survey to RCN reviews, examining their views on the clarity and importance of the review criteria.

In sum, RCN has a large number of standardised criteria applied across funding schemes. There are some perceived challenges in using the RCN review criteria, some of which derive from the large set of diversified criteria partly addressing overlapping aspects.

### **3.2.2 The Netherlands Organisation for Scientific Research (NWO)**

NWO has two key review criteria common to all its funding instruments: 'Science excellence/quality' and 'Knowledge utilisation'. In addition to these, programmatic criteria are often added.<sup>61</sup> There is no general description of the criteria on the website and they are used and weighted differently depending on the objective and rationale of the programme. In line with the reorganisation of the agencies' funding instruments (see Section 2.2.2), there are plans for more harmonisation of assessment criteria across the organisation.

For Top Grant proposals (part of the Free Competition Programme, see Section 2.2.2), in addition to the scientific quality (criterion 1) and knowledge utilisation (criterion 3) of the project, reviewers are asked to assess the innovative character (criterion 2) of the proposed research and the past performance of the research group (criterion 4). Criterion 1, 2 and 4 weigh equally, each accounting for 30 per cent of the total score, criterion 3 accounts for the remaining 10 per cent.

In free competition proposals, the scientific quality of the proposal is assessed in terms of the objectives, methodology and research team. For these kind of projects reviewers should also assess programmatic criteria, defined in terms of added value, coherency and organisation. The division for Earth and Life Sciences offers free competition grants ('Open Programme'). Research proposals submitted to the programme are assessed with four criteria: innovative nature (weighting 1/3),

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<sup>58</sup> Six respondents in the survey for the evaluation of the RCN and eight respondents in the FRIPRO survey addressed this. The free text replies from the survey for the evaluation of the RCN are found in Appendix C in Langfeldt et al. 2012b. This section is based on analysis of the raw data from the surveys.

<sup>59</sup> Moreover, one of respondents commented that one should not use the same criteria to assess different disciplines.

<sup>60</sup> They give the FRIPRO scheme better scores at supporting well-founded and solid research than on supporting original and ground-breaking or high risk research (Langfeldt et al 2012b:72).

<sup>61</sup> For the more innovation oriented projects (such as KIEM), excellence as a general criteria does not apply, and is replaced by 'Innovation potential' in addition to the criteria 'Composition of the team'. Pilot applications are also reviewed by different criteria than other types of applications. For these type of applications, reviewers are asked to assess 'the scientific aspects of the project' and 'technical feasibility'.

scientific quality of the proposal (weighting 1/3), scientific quality of the group (weighting 1/6), knowledge utilisation (weighting 1/6). In this case, the referees and the committee are not asked to judge the assessment criterion knowledge utilisation. The score of this criterion is defined by the NWO division<sup>62</sup>.

It should be added that rebuttals from applicants play an important role in the NWO assessment process: The applicants are given the opportunity to respond to the (anonymous) referees' assessment (referee's report) and the rebuttals may be used by the selection committee when determining the quality of the referees' assessment. According to the NWO, this opportunity increases the transparency and the overall objectivity of the selection process.

The selection committee compares and prioritises/ranks the proposals using the assessment criteria, based on the expert assessments and rebuttals from applicants. This final assessment forms the basis for the selection committee's advice to the board. The committee's assessment of each research proposal is summarised according to a 4-graded scale ('qualification system') to inform the applicant about the quality of the proposal: excellent, very good, good, unsatisfactory.<sup>63</sup>

In sum, there is considerable flexibility and adaptability, and also some standardisation in the NWO review criteria. There are two cross-cutting overall review criteria (Science excellence and Knowledge utilisation), used/weighted differently in the various schemes/programmes. For each funding scheme there is a clear description of the review criteria, including the relative importance of each criteria (weighing). The various funding schemes operate with several additional criteria and there are no general (cross programme) descriptions of the review criteria. Still, all schemes comply with an overall general description of the review process and use the same rating scale, and there are plans for increased harmonisation of criteria.

### **3.2.3 The National Science Foundation (US, NSF)**

NSF has two general merit review criteria across all programmes. The reviewers are asked to assess how the projects may advance knowledge, and how they may benefit society:

- *Intellectual Merit*: The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- *Broader Impacts*: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.'

For both criteria the following elements are to be considered:

1. 'What is the potential for the proposed activity to:
  - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
  - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?'<sup>64</sup>

Together the criteria cover a variety of aspects, including scientific and non-scientific relevance/significance (advance knowledge and benefit society), originality, feasibility/methods and the qualifications and resources of the applicants and the research environment. Notably, 'broader

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<sup>62</sup> <http://www.nwo.nl/en/funding/our-funding-instruments/nwo/free-competition/alw/open-programme.html>

<sup>63</sup> For funding instruments with a pre-selection, there is in addition the category 'is not eligible for this phase of the NWO selection procedure.

<sup>64</sup> [http://www.nsf.gov/pubs/policydocs/pappguide/nsf16001/gpg\\_3.jsp#IIIA2a](http://www.nsf.gov/pubs/policydocs/pappguide/nsf16001/gpg_3.jsp#IIIA2a)



impact' is a comprehensive criterion, including any potential benefit to society relevant to the proposed project (e.g. education, health and security, as well as enhanced infrastructure for research and education).

Intellectual merit and broader impacts of the proposed activity are assessed for all proposals, without giving them separate grades. Each proposal is solely given one overall grade.<sup>65</sup> There are no general rules for the relative emphasis of the two criteria in the overall assessment; emphasis may depend on the type of programme and the call for proposal, and also the discretion of the individual reviewers. However, the reviewers are asked to provide comments on each criterion and instructed that 'Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient.'<sup>66</sup>

In addition to the two standard criteria, programmes may employ additional criteria, stated in the call for proposals/programme solicitation. E.g. for CREST Centers, the integrative nature of the proposed centre is an additional review criterion, and for 'Partnerships for Innovation: Accelerating Innovation Research-Technology Translation' there are additional criteria concerning technology transfer, suitability of the project team, involvement of students, market needs, commercialisation and protection of intellectual property.<sup>67</sup>

No separate ratings are given for additional criteria. The review form only asks for an overall assessment/rating.<sup>68</sup> The reviewers are asked to provide comments for each criterion, and one overall rating. This reflects the distinctive role of the NSF programme officers and long traditions in the NSF. The NSF asks the reviewers for assessments and advice, whereas the programme officers make funding recommendations based on the written reviews and (often also) panel discussions. As both individual reviewers and panels may apply ratings differently, interpreting and comparing ratings is a complex task, and here the discretion of the programme officers and the content and arguments of the reviews are seen as more important than e.g. quantifiable average rates. Hence in general, the NSF does not see separate ratings for each criterion as needed or desired.

*In sum*, the NSF has two common, standard criteria applying for all funding schemes/programmes. These review criteria are explicitly and consistently communicated to applicants<sup>69</sup>. For programmes with additional review criteria, the additional criteria are presented in the programme solicitation/call for proposals.

In a historical study of the NSF review criteria, Rothenberg concludes that already from 1960s the trend in the NSF has been to reduce the number of criteria, and at the same time broaden the definition of each criterion (Rothenberg 2010). The two present merit review criteria were introduced in 1997. The aim was criteria that were clearer and easier to apply. Surveys had pointed to a lack of understanding of some of the previous criteria and that some criteria were often ignored (Rothenberg 2010:297). Notably, the 'scientific merit of the proposed research' was a key criterion already in the first call for proposals in 1951, and proposals were also expected to address what is 'broader impact' in today's NSF language (Rothenberg 2010:294). A review of the merit review criteria in 2011 found that the intellectual merit review criterion was well defined and clearly understood, but pointed to difficulties in the understanding of the broader impacts criterion (NSF 2011:8). Even after many years and efforts to provide clear criteria, the broader impact criterion is not as clearly understood as the intellectual merit criterion.

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<sup>65</sup> Review forms/information available on the NSF website contains a five-grade scale: Excellent, Very Good, Good, Fair, and Poor [https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane\\_Help/pd\\_proposal\\_review/pd\\_proposal\\_review.pdf](https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane_Help/pd_proposal_review/pd_proposal_review.pdf); <http://www.nsf.gov/pubs/1997/iin121/od9708f.htm>

<sup>66</sup> [http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg\\_3.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg_3.jsp)

<sup>67</sup> <http://www.nsf.gov/pubs/2016/nsf16525/nsf16525.htm>; <http://www.nsf.gov/pubs/2015/nsf15570/nsf15570.htm>

<sup>68</sup> [https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane\\_Help/pd\\_proposal\\_review/pd\\_proposal\\_review.pdf](https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane_Help/pd_proposal_review/pd_proposal_review.pdf)

<sup>69</sup> Whereas the criteria are actively communicated to applicants, the review form and grade scale is not. It is still available and may be retrieved in the FastLane Help System: [https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane\\_Help/pd\\_proposal\\_review/pd\\_proposal\\_review.pdf](https://www.fastlane.nsf.gov/NSFHelp/Printdocs/FastLane_Help/pd_proposal_review/pd_proposal_review.pdf)

### 3.2.4 VINNOVA (SE)

All VINNOVA applications are assessed with the following main criteria: *Potential, Participants and Feasibility*. Together these criteria cover a variety of aspects, including scientific and non-scientific relevance/significance (advance knowledge and benefit society), originality, feasibility/methods and the qualifications and resources of the applicants and the research environment. The criteria emphasise especially the innovation potential of the proposed research and the ties between the project partners. The description of the criteria (sub-criteria) vary greatly depending on the call/programme. The criteria are rated on a scale from 0-5 (same as in Horizon 2020). The main criteria are weighted but the relative weight between the criteria differ depending on the type of grant. Applicants are informed about the relative weight of the criteria in the call texts. The thresholds may also vary depending on the type of programmes. Thresholds may for instance be lower for pre-proposals and higher for projects requesting a larger financial contribution. A general principle is that the numerical scores and thresholds should not determine the outcome of the review. Feedback to applicants is provided by the overall comments from the reviewers and their position on the ranked list.<sup>70</sup>

Table 3.4 provides an example of the assessment criteria for the call for proposals under one of the Strategic Innovation Programmes (Produktion2030):<sup>71</sup>

**Table 3.4 VINNOVA assessment criteria, as specified for Produktion2030**

| Main criteria                  | Criteria   | Description  |
|--------------------------------|--|--|
| <b>Potential</b>               | Scientific Excellence                              | Scientific support and quality.  |
|                                | Industrial state of the art                        | The project's ability to contribute to the development of production techniques and production methods   |
|                                | The project's technological development            | How well does the project describe an increase in MRL of by least one step to achieve MRL 4-7?   |
|                                | Sustainability                                     | How effective are the project objectives described in terms of sustainability?   |
|                                | Relevance to the call for proposals' challenges    | How well does the application correspond to the focused challenges in this call for proposals?   |
| <b>Constellation of actors</b> | The Project consortium's composition and expertise | How well does the project management's expertise reflect the goals for the project? How well do the contributions of the indicated project participants correspond with the needs of the project plan? |
|                                | Clearly-defined roles                              | How well have the project participants' roles been described?  |
|                                | Diversity  | What does the project consortium look like regarding diversity, gender and equality?   |
| <b>Feasibility</b>             | Realistic plans and choice of methods              | How realistic are the project's timetables and activity plans and how well are the project's measurable objectives described. How well is the choice of methods in the project justified               |
|                                | Collaboration                                      | How well is the collaboration between the project parties described??  |
|                                | Risk analysis                                      | How well are identified risks (from the risk analysis) considered?   |

Note: In this call for proposals, the criteria have equal weight in the assessment.

Regardless of the common main criteria across programmes, there is much flexibility in adapting the review process to the various funding instruments. Notably, the Strategic Innovation Programmes (SIPs, or 'Mini-VINNOVAs', see Section 2.2.4) diverge from other programmes in that the selection process is a shared responsibility between VINNOVA and the SIP management.<sup>72</sup> SIPs are normally responsible for defining the calls for proposals and the project proposals go to both the SIP management and to VINNOVA. For a smooth processing of the proposals the VINNOVA review panel classify projects through a 'traffic-light system' (yes/maybe/no), and the SIP management has the role

<sup>70</sup> According to a recent report, participants from UDI projects think the programme needs clearer selection criteria at each stage of the three-stage model, with adequate feedback mechanisms to rejected applicants (OECD, 2016 p. 149).

<sup>71</sup> [http://www.vinnova.se/EffektaXML/ImporteradeUtllysningar/2014-01174/Utlysning%20Produktion2030%20Utlysning%204%20va%CC%8Aren%202016\\_EN\\_160503.pdf\(730211\).pdf](http://www.vinnova.se/EffektaXML/ImporteradeUtllysningar/2014-01174/Utlysning%20Produktion2030%20Utlysning%204%20va%CC%8Aren%202016_EN_160503.pdf(730211).pdf)

<sup>72</sup> The first call for proposals to establish and implement programmes for strategic innovation areas, SIO programmes, was launched in 2013.

of commenting on the relevance of the projects to the call. Proposals are reviewed by independent expert panels based on their potential, structure and management.

In sum, for all programmes VINNOVA has three general review criteria (Potential, Participants and Feasibility). The definitions (sub-criteria) of these criteria are adapted to the specific programmes. Moreover, the relative emphasise of the main criteria (the three rates) varies by programme objectives.

### **3.2.5 Natural Environment Research Council (UK, NERC)**

NERC has one key review criterion common to all funding schemes: 'Excellence'. When giving scores on this criterion, reviewers are asked to consider both significance and feasibility:

- the potential rewards of the project: the significance and quality of the work, and the scientific impact it will have in terms of enhancing or developing insights, developing the field and adding to knowledge or understanding in the area to be studied in a national or international context;
- the extent to which the research questions, issues or problems that will be addressed through the work are stated and their importance and appropriateness specified; and
- the appropriateness, effectiveness and feasibility of the proposed research methods and/or approach.

Moreover, originality is explicitly included – along with significance – in the guidelines for rating the proposals. 'Outstanding', the highest rate (6 on a scale from 0 to 6)<sup>73</sup>, is described as follows:

- The proposed work meets outstanding standards in terms of originality, quality and significance and addresses extremely important scientific questions or will enable them to be addressed through technological development.

Whereas 'excellence' is the only assessment criterion for responsive mode proposals/discovery science (independent, researcher-initiated projects), additional criteria apply in the strategic programmes. Reviewers are asked to assess to what extent the proposals are aligned with the relevant programme's scientific and non-scientific objectives ('Fit to scheme', one rate for scientific objectives and one for non-scientific objectives).

Moreover, for fellowship proposals, suitability of the applicant is an additional criterion. Reviewers are asked to assess whether the applicant has the 'potential to become a world class research leader'.<sup>74</sup>

Adding up this, we find the maximum number of rated criteria, in the case of fellowship proposals within the research programmes (4 criteria), with one rate for excellence, one for suitability of applicant, one for fit to scientific objectives of scheme and one for fit to non-scientific objectives of scheme.

In addition to the rated criteria, the individual reviewers (and panels) are asked to comment on resources requested for the project (whether the resources are essential, sufficient and justified) and in some cases other issues, including commenting on the facilities and support of the host department and indicating interview questions to fellowship applicants who reach the interview stage.

Moreover, the panel is asked to comment on whether proposals' plans for dissemination and impacts (its 'Pathways to impact' description) is acceptable or not. NERC demands that all proposals contain a description of the potential societal and economic impact of the project, and outline the steps to

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<sup>73</sup> 0-6 is the scale used in the individual reviews. In the panel review, the scores are more fine-graded (0-10).

<sup>74</sup> More specifically, they are asked to consider whether the applicant has: 'demonstrated their research vision and philosophy and outlined ways in which their research could be developed over the 5 year fellowship; explained how they will contribute to the international research area and interact with the leading international groups in their field; shown a thorough grasp of their discipline and whether they offer considerable promise as an independent researcher; demonstrated, that if awarded a fellowship, they will be genuinely working independently of senior colleagues with whom they might have previously collaborated or for whom they might be working in a supporting role'.

facilitate this impact. Impact assessment is not part of the assessment criteria, but is commented separately by the panel and an acceptable 'Pathways to impact' is a condition for funding.

Contrary to this, NERC *innovation projects* are assessed solely on potential impact<sup>75</sup>, and Knowledge Exchange Fellowships are assessed on potential impact and the suitability of the fellow<sup>76</sup>. Hence for some (smaller) schemes, excellence as a general review criterion do not apply, and is replaced by impact as a prime review criterion.

Final scores and ranking of proposals are set by 'moderating/assessment panels'. No separate overall or average rate is given in the case where more than one rate is given. The panel is instructed that the scores of individual reviewers are 'not to be summed or averaged by the panel but treated as distinct scores'. Moreover, panels assessing and ranking strategic research proposals, where there are more than one criteria, are asked to do so without providing a unified or averaged score, and there are no defined weights for the various criteria. The panels are told that their ranking must reflect all three prime criteria (excellence; fit to scientific objectives of scheme; fit to non-scientific objectives of scheme),<sup>77</sup> and are normally also given guidelines on thresholds for the ranking list. There may for instance be a threshold on 3 out of 6 on 'fit to scheme', and then the proposals are ranked based on 'research excellence'. NERC staff emphasize that ranking based on simple averages of the scores on the different criteria would make little sense, as the rating scale is often used differently, and that the review comments are important when ranking the proposals.

In sum, even with a large number of schemes and programmes, NERC has a limited set of review criteria and these are applied across the various funding instruments. The criteria seem well established, they function well according to informants and there are no ongoing processes to revise them. The NERC *excellence* criterion is comprehensive and general, and applies regardless of funding scheme and type of funding, whereas the two *fit to scheme* criteria enable customising the review to the individual programmes. Notably, there are some exceptions where the *excellence* criterion does not apply, as for innovation projects.<sup>78</sup> Still, to the general applicant, the assessments criteria are presented as uniform and simple: 'excellence' and 'fit to scheme'<sup>79</sup>.

### **3.2.6 Horizon 2020 (apart from ERC)**

The assessment criteria, scoring and thresholds for evaluating Horizon 2020 proposals are common to all funding schemes and are described in part H of the General Annexes to the Horizon 2020 Work programme. The general rule is that experts are to assess proposals on the bases of three criteria: *Excellence, Impact and Quality and Efficiency of Implementation*. There may however be some exceptions to the general rules (for instance in terms of how criteria are to be weighted) which are specified in the call texts.

For all types of actions/funding instruments the following aspects are to be considered under the three common criteria<sup>80</sup>:

- *Excellence*: Clarity and pertinence of the objectives; Soundness of the concept, and credibility of the proposed methodology;
- *Impact*: The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic;
- *Quality and efficiency of the implementation*: including extent to which the resources assigned to work packages are in line with their objectives and deliverables; Appropriateness of the

<sup>75</sup> In assessing potential impacts, the panel considers outcomes and benefits, strength of end-user involvement, mechanisms for delivery of outcomes and potential impacts, and the sustainability of impacts.

<sup>76</sup> <http://www.nerc.ac.uk/funding/available/schemes/innovation-projects/ip-guidance/>

<sup>77</sup> <http://www.nerc.ac.uk/funding/available/schemes/kefellows/kefellowscall/kefellow-info/>

<sup>78</sup> Moreover, for capital funding 'Fit to scheme' may be the only assessment criterion.

<sup>79</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/programmeguidance/>

<sup>80</sup> <http://www.nerc.ac.uk/funding/application/awards/2014/sesc-call-2014/>

<sup>80</sup> Except for Framework Partnership Agreement.

management structures and procedures, including risk and innovation management; Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise; Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.

Apart from these, the aspects to be considered depend on the type of action/funding instrument. While the same type of aspects applies for Research and Innovation Actions, Innovation Actions and SME instrument actions, all other instruments have their own specific aspects (see table A19 in the appendix 4 for a complete overview). The MSCA programme has its own evaluation procedures but proposals are evaluated with the standard H2020 criteria ('Excellence', 'impact', 'quality and efficiency of implementation') and with specific sub-categories.

Independent experts evaluate proposals and a panel review recommends one or more ranked lists, following a specific scoring system. Evaluation scores are given to the three overall award criteria and not for the different sub-aspects to be covered. As in FP7, the criteria have the same minimum threshold for funding (3 on a scale from 1 to 5 and an overall threshold of 10) and in general they are given equal weights in the overall assessment. Unlike FP7, for 'Innovation actions' and the 'SME instrument actions', the Impact criterion is given extra weight in the overall assessment (weight 1.5). A further novelty compared to FP7 is that proposals are evaluated on their own merit, the final negotiation step between the EU Commission and the grantees therefore no longer exists.

In the first step of the evaluation process, experts carry out an individual evaluation, with comments and scores for each criterion. The individual experts then meet and agree to common scores and comments in a consensus report. In certain cases, a median or mean value of the individual scores may be taken as the consensus score (such as in first stage in two-stages submission schemes or in the SME instruments). A panel review then goes through all the proposals of a call, controlling the consistency of the consensus reports of the experts and proposing, if necessary a new set of marks and comments. Proposals that passed the threshold are finally ranked by the Commission according to the results of the evaluation of the experts.

In the case where proposals receive equal score from the panel, the general annexes provide rules for selecting the winning proposal. Prioritisation is given to the size of budgets allocated to SMEs and gender balance amongst the research and/or innovation personnel named in the proposal.

In sum, H2020 has three review criteria used across funding schemes: Excellence; Impact: Quality and efficiency of the implementation. The aspects considered under each criterion vary somewhat between grant types (defined sub-criteria by 'type of action'). Moreover, there are common review procedures and rating scales across schemes, with some variation between grant types when it comes to the relative weighting of the three criteria.

### **3.2.7 ERC**

For all ERC frontier research grants, excellence is the sole criterion of evaluation. The excellence criterion is applied for assessing both the proposed research and the Principle Investigator. For *Starter, Consolidator and Advanced* grants reviewers are asked to make an assessment of the "ground breaking nature, ambition and feasibility of the proposed research and "the intellectual capacity, creativity and commitment" of the principal investigator. For advanced grants, reviewers are in addition asked to assess whether the PI has demonstrated leadership in training and advancement of young scientists (see Table A20 in the Appendix 4). The interpretations (sub-questions) of the criteria may change from year to year based on the recommendations from the members of the ERC panels and the Scientific Council.

*Proof of Concept* grants are evaluated against other evaluation criteria than excellence. However, a requirement is that funded activities must draw significantly on the excellent research funded by the related ERC frontier grant. The main criteria for assessing Proof of concept proposals are: excellence

(interpreted as “innovation potential”), impact and quality and efficiency of the implementation (of the proof of concept plan). The criteria are evaluated on a pass or fail basis by independent peer reviewers. In order to be considered for funding, proposals must receive a pass mark by a majority of peer reviewers on each of the three evaluation criteria.

The peer review evaluation of the ERC frontier grants is carried out by means of subject specific Panel Members (normally composed by 3 generalists) and (in step 2) remote referees (2-3) who are scientists and scholars with specialised expertise.<sup>81</sup> The proposals go through a two-step procedure: In step 1, panel members evaluate individually part B1 of the proposal, consisting of the synopsis of the proposed research and the applicant’s CV. They provide numerical rates on a scale from 1 to 4<sup>82</sup> for each of the two evaluation criteria (the proposed research and the Principal Investigator). In step 2 the full proposal (part B2) is evaluated by remote referees and panel members. In addition to the rates reviewers are asked to provide, there are written comments substantiating the rate. The comments from the individual assessments are also included in the final Evaluation Report provided to the applicants. The numerical rates are only given in the individual evaluation phase and determine the relative position on the ranked list and serve as a starting point for the discussions in panel meetings. The outcome of panel meetings is a ranked list of proposals expressed in rates (A, B or C). At the end of step 2 the panel produces a final ranked list. Only proposals scored A are recommended for funding.<sup>83</sup>

The criteria, including any proposal scoring, are set out in the ERC work programme, based on principles set out in the Rules for Participation. The information documents for the call further explain how these criteria are applied.

In sum, the ERC applies a sole review criterion (excellence) across their funding schemes (with the exception of Proof of Concept proposals). In the first phase of the review, the proposed research and the PI are given separate assessments/rates (on excellence), whereas the review panel gives one overall rate. The sub-questions to reviewers vary somewhat between the types of grants, and may also be modified based on feedback from the previous year’s panels.

### **3.2.8 Summary – comparative overview**

There is large variation between the mapped funding agencies when it comes to number and diversity of review criteria. Still, as shown in Table 3.4, most agencies operate with review criteria that cover most of the general dimensions in assessing research proposals as identified in Section 3.1.

In some cases, one review criterion (understood as what is rated separately) covers several dimensions. For example, the one rate given to NSF proposals are to cover all six dimensions in Table 3.4. All six dimensions are included in the NSF review guidelines, but the different dimensions are not rated separately – each proposal is given one overall rate only. In other agencies (with the exception of NERC Discovery Science), there are more separate rates, some covering one dimension, some covering multiple dimensions. The two RCN grant types included in the table, are the only examples found with multiple rates for one dimension (e.g. two rates under feasibility for IPN proposals). The RCN also has highest number of separately rated criteria, with 6 and 7 rates for the RCN schemes included in the table.

Moreover, the mapping reveals different approaches to standardising review criteria (Table 3.5):

- RCN has a large number of standardised criteria applied across funding schemes. Each funding instrument/type of grant use a defined set of these criteria: The number of review criteria varies from 2 to 17 depending on grant type. There are some perceived challenges in

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<sup>81</sup> The remote referees do not participate in panel meetings and are normally invited to the assessment process only in the second step of the review process.

<sup>82</sup> Marks range from 1 (non-competitive) to 4 (outstanding).

<sup>83</sup> ERC Grant Schemes. Guide to Peer Reviewers.

using the RCN review criteria, some of which derive from the large set of customised criteria partly addressing overlapping aspects.

- H2020, ERC and VINNOVA each have a small set of overall criteria that are adapted to the individual schemes/calls for proposals. The same (2-3) criteria are used across funding schemes with slightly different guidelines/issues to be included for the different schemes. ERC has one overall criteria (Excellence), which is rated separately for the proposed research and the applicant/PI in the first stage of the review, and moderately adapted to the three main grant types.
- NERC and NSF apply one general/key criterion across (nearly all) their funding schemes. NERC has some additional standard criteria for specific types of funding instruments (as 'fit to scheme' for all strategic programmes) and one crosscutting criterion that needs approval but is not rated ('Pathways to impact'). NSF programmes may also apply additional criteria defined. These are however defined in the individual calls for proposals (i.e. *not* standardised across schemes as in NERC), and not rated separately.
- NWO operate with some overall standardisation of criteria. There are two general aspects/criteria across funding schemes (scientific quality and knowledge utilisation), combined with considerable flexibility and adaptability to the individual schemes, and without any general definitions of the cross-cutting criteria.

In sum, the majority of the funding agencies operate with a limited number of standard review criteria combined with some flexibility in terms of different adaptations of the standard criteria (H2020, ERC and VINNOVA) or additional criteria (NERC and NSF) for some funding schemes. The needs for diversity and streamlining of review criteria across funding schemes is discussed in Chapter 4.

**Table 3.5 Review criteria rated separately (by external reviewers/panels), number of criteria by category**

| Agency                                  | Proposed research                                     |                                   |   |  | Applicant  | Research environment             | Other                    | Sum rates/criteria  | Overall rate          |
|---|---|-----------------------------------|---|--|--|----------------------------------|--------------------------|---------------------|-----------------------|
|   | Scientific quality                                    | Originality                       | Feasibility   | Relevance/expected impacts   |  |                                  |                          |                     |                       |
| <b>NERC</b> Discovery science           | 1 'Excellence'  | (mentioned in guide)              | (mentioned in guide)  | ('Pathways to impact' not rated)   |  |                                  |                          | 1                   | Yes (only rating)     |
| <b>NERC</b> Strategic Research          | 1 'Excellence'  | (mentioned in guide)              | (mentioned in guide)  | 2 ('fit to scheme' scientific and non-scientific objectives) ('Pathways to impact' not rated)      |  |                                  |                          | 3                   | No                    |
| <b>NSF</b>                              | 'Intellectual merit'                                  | (mentioned in guide)              | (mentioned in guide)  | 'Broader impacts'  | (mentioned in guide)                                 | (mentioned in guide)             |                          | 1                   | Yes (only rating)     |
| <b>RCN</b> Researcher project           | 1 'Scientific merit'                                  | (mentioned in guide)              | 1 'Implementation plan and resource parameters'   | 2 (Relevance relative to the call for proposals; Dissemination and communication of results)       | 1 'Project management and the Project group'         | 1 'International cooperation'    | 1 'National cooperation' | 7                   | Yes                   |
| <b>RCN</b> IPN                          |   |                                   | 2 ('R&D project quality'; 'Realisation of the innovation')  | 3 ('Level of research'; Level of innovation; Potential for value creation for industrial partners) | 1 'Implementation capacity'                          |                                  |                          | 6                   | No                    |
| <b>H2020</b> main part                  | 1 'Excellence'  |                                   | 1 ('Quality and efficiency of the implementation') Clarity and credibility is also part of 'Excellence' | 1 ('Impact')   | (part of feasibility assessment)                     | (part of feasibility assessment) |                          | 3                   | No (fixed weights)    |
| <b>ERC</b> (not incl. Proof of concept) | 1 'Ground-breaking nature, ambition and feasibility'  | (mentioned, not rated separately) | (mentioned, not rated separately)   |  | 1 'Intellectual capacity, creativity and commitment' |                                  |                          | 2 (ind. reviewers)* | Yes (panel)           |
| <b>NWO</b> Veni, Vidi, Vici             | 1 'Quality, innovative character and academic impact' | (mentioned, not rated separately) |   | 1 'Knowledge utilisation' ('academic impact' is rated as part of quality)                          | 1 'Quality of the researcher'                        |                                  |                          | 3                   | Yes (fixed weights)   |
| <b>VINNOVA</b>                          | ('Potential' may include scientific excellence)       |                                   | 1 'Feasibility'   | 1 'Potential'  | 1 'Participants'                                     |                                  |                          | 3                   | No (weights may vary) |

\*The remote reviewers/individual panel members give separate rates for the two criteria, the panel only gives one overall rate.



**Table 3.6 Overview review criteria, rating and guidelines**

| Agency                 | Standard criteria across funding schemes                | Aspects covered by review criteria   | Rating   | Guidelines, how criteria are made clear to applicants  |
|------------------------|---|--|--|--|
| <b>NERC</b>            | Yes   | <p><i>Five criteria used across (most or some) schemes:</i><br/> <b>Excellence:</b> Scientific significance, originality, feasibility, appropriateness of methods (this is the only criterion for Discovery Science)<br/> <b>Fit to scheme/scientific objectives</b> (objectives vary by programme)<br/> <b>Fit to scheme/non-scientific objectives</b> (objectives vary by programme)<br/> <b>Suitability of applicant</b> (fellowships only): Potential to become a world class research leader.<br/> <b>Potential impact</b> (innovation funding only): Outcomes and benefits, strength of end-user involvement, mechanisms for delivery of outcomes and potential impacts, and the sustainability of impacts<br/>                     In addition: 'Pathways to impact' across all schemes (not rated)</p>                         | Each criterion is rated individually. No average score or general rules for relative emphases when more than one criterion. Some aspects are commented on by reviewers and/or panels, but not rated (Pathways to impact; resources). | Clear: Reviewer and applicant guides are downloadable on the same webpage.   |
| <b>NSF</b>             | Yes   | <p><i>Two main criteria for all NSF proposals:</i><br/> <b>A) Intellectual merit:</b> potential to advance knowledge and understanding within its own field or across different fields<br/> <b>B) Broader impacts:</b> potential to benefit society and contribute to the achievement of specific, desired societal outcomes. 5 elements be considered in the review for both criteria (see Section 3.2.3).<br/>                     Programmes may employ additional criteria.</p>  | Proposals are given an overall assessment. Both criteria need to be considered, but no general rules for relative emphases or thresholds for funding.  | Criteria are explained in the applicants' guidelines, and linked from a separate webpage explaining the NSF merit review – both common for all NSF proposals.                |
| <b>RCN</b>             | Standards for types of grants, not for schemes          | <p><i>Criteria vary by type of grant ('application types') and sometimes by call. From two to more than 10 criteria by grant type (see Appendix 2). In addition, general aspects that should be considered in all RCN schemes (ethics, gender, environment).</i></p>   | Each criterion is rated individually. In most cases a separate overall score is given. No fixed rules for relative weighting of the criteria into the overall score.   | Criteria for each grant type listed/explained on webpage, without distinguishing which are rated by the reviewers.   |
| <b>H2020 main part</b> | Yes (some modification according to funding instrument) | <p><i>Three main criteria for all proposals:</i><br/> <b>A) Excellence:</b> Clarity and pertinence of the objectives; Credibility of the proposed approach (additional criteria under the specific actions).<br/> <b>B) Impact:</b> The extent to which the outputs of the project should contribute at the European and/or International level (ref. to the expected impacts listed in the work programme under the relevant topic).<br/> <b>C) Quality and efficiency of the implementation:</b> Work plan; participants; management structures and procedures.<br/>                     Differences between funding instruments: The three criteria are specified and weighed somewhat differently.</p>   | Each criterion is rated individually.<br><b>Thresholds:</b> Minimum score on all three criteria (may vary according to the work programme)   | Clear: A 'self-evaluation form' explains the criteria to applicants.   |
| <b>ERC</b>             | Yes   | <p><b>Starting Grants/Consolidator Grants/Advanced Grants:</b><br/> <b>Excellence:</b><br/>                     A) Research Project: Ground-breaking nature, ambition and feasibility<br/>                     B) Principal Investigator: Intellectual capacity, creativity and commitment<br/> <b>Proof of Concept:</b><br/>                     A) Excellence/Innovation potential<br/>                     B) Impact<br/>                     C) Quality and efficiency of the implementation/proof of concept plan</p>   | Individual reviewers rate each criterion separately (scale from 1 to 4). Panels give one overall rate (A-C).<br><br>Proof of Concept: Pass or fail.  | Clear: A 'self-evaluation form' explains the criteria to applicants.   |
| <b>NWO</b>             | Partly  | <p>Science quality and 'Knowledge utilisation' are crosscutting criteria. Their use/weighting vary between schemes.<br/> <b>Examples of criteria for individual schemes:</b><br/> <b>Criteria for Veni, Vidi and Vici</b> (weighting A 40%; B 40%; C 20%):<br/>                     A) Quality of the researcher<br/>                     B) Quality, innovative character and academic impact of the proposed research<br/>                     C) Knowledge utilisation<br/> <b>Programme on astroparticle physics:</b><br/>                     A) Scientific quality and originality of the proposal (30%)<br/>                     B) Quality of the research team (30%)<br/>                     C) Coherence and interdisciplinary character of the programme (30%)<br/>                     D) Knowledge utilisation (10%)</p> | The criteria are normally rated separately.<br>(Four categories:<br>• excellent<br>• very good<br>• good<br>• unsatisfactory)  | The call documents explain the selection criteria to applicants. There is a common webpage explaining the selection process. Review guidelines are not available at website. |
| <b>VINNOVA</b>         | Yes   | <p><b>Three main, crosscutting criteria:</b><br/>                     A) Potential<br/>                     B) Participants<br/>                     C) Feasibility<br/>                     with sub-criteria varying by call</p>   | Each criterion is rated individually. Weighting may vary.  | The call documents describe the selection process and criteria to applicants. No review forms or guidelines on website.  |

### 3.3 RCN reviewers' views on the importance and clarity of criteria

To explore how reviewers perceive the RCN review criteria, NIFU conducted a survey including reviewers of Researcher projects, Knowledge-building Project for Industry (KPN) and Innovation Projects for the Industrial Sector (IPN). As noted in Section 3.2.1, these grant types operate with clearly different sets of review criteria. Of a total of 995<sup>84</sup> reviewers who reviewed the relevant types of proposals in 2015 were invited to participate in the survey. Of these 537 (54 per cent) replied/completed survey.<sup>85</sup> The response rates varied by type of grant, with highest response rate from the Research project reviewers, and lowest from the IPN reviewers: 59 per cent of the 669 Researcher project reviewers, 49 per cent of the 298 KPN reviewers and 41 per cent of the 131 IPN reviewers replied<sup>86</sup>. Note that calculating respondents this way adds up to a full sample of more than 995 respondents as some of them had reviewed multiple types of grants.

The respondents were asked to rate the importance and clarity of each review criterion, and to compare the RCN criteria with those of other funding agencies they were acquainted with. They were also given the option to provide free text comments on their experience with the RCN review criteria and guidelines, and possible improvements.

#### The review criteria's relative importance

The survey results show large differences in perceived importance of the RCN criteria. 'Scientific merit' prevails as the clearly most important review criterion from the point of view of the reviewers (Figure 3.3). 94 per cent of those who had assessed Researcher projects rated 'Scientific merit' as a highly important criterion for these projects. None of the other criteria – for any of the three grant types studied – are seen as similarly important. Notably, Researcher projects also comes up with the most unimportant criteria – 'National cooperation' which only 8 percent of the respondents rate as highly import and another 35 percent as important.

Ideally, a large part of the reviewers should find the criteria they apply highly important, otherwise there is reason to believe that the criteria are not clearly understood and well defined, or that one has not found the correct group of experts to perform the reviews (provided the criteria are highly important to the Research Council/the funding schemes to be implemented).

Several of the criteria for Researcher projects are not found important by a substantial part of the reviewers. In addition to 'National cooperation', 'International cooperation' and 'Dissemination and communication of results', are rated highly important only by a minority of reviewers, whereas some reviewers find these criteria to have little or no importance (scoring 1 or 2). In their open comments, some of the respondents explained why they found these criteria less important (e.g. that they do not matter in themselves/form part of scientific merit, see section with comments on the Researcher projects criteria below).

There are no large differences in importance when spitting replies by the reviewers' field of expertise. Still, the 'project management and the project group' seem to be found slightly more important by the reviewers in the medical sciences than in other fields (average score 4.6 in the medical science, compared to a total score of 4.3 when including all fields, Table A8 in Appendix 1). Moreover, 'dissemination and communication of results' seem more important in the humanities and social sciences than in other fields (average score 4.0 in the humanities and 4.1 in the social sciences, compared to a total score of 3.7 when including all fields, Table A8 in Appendix 1).

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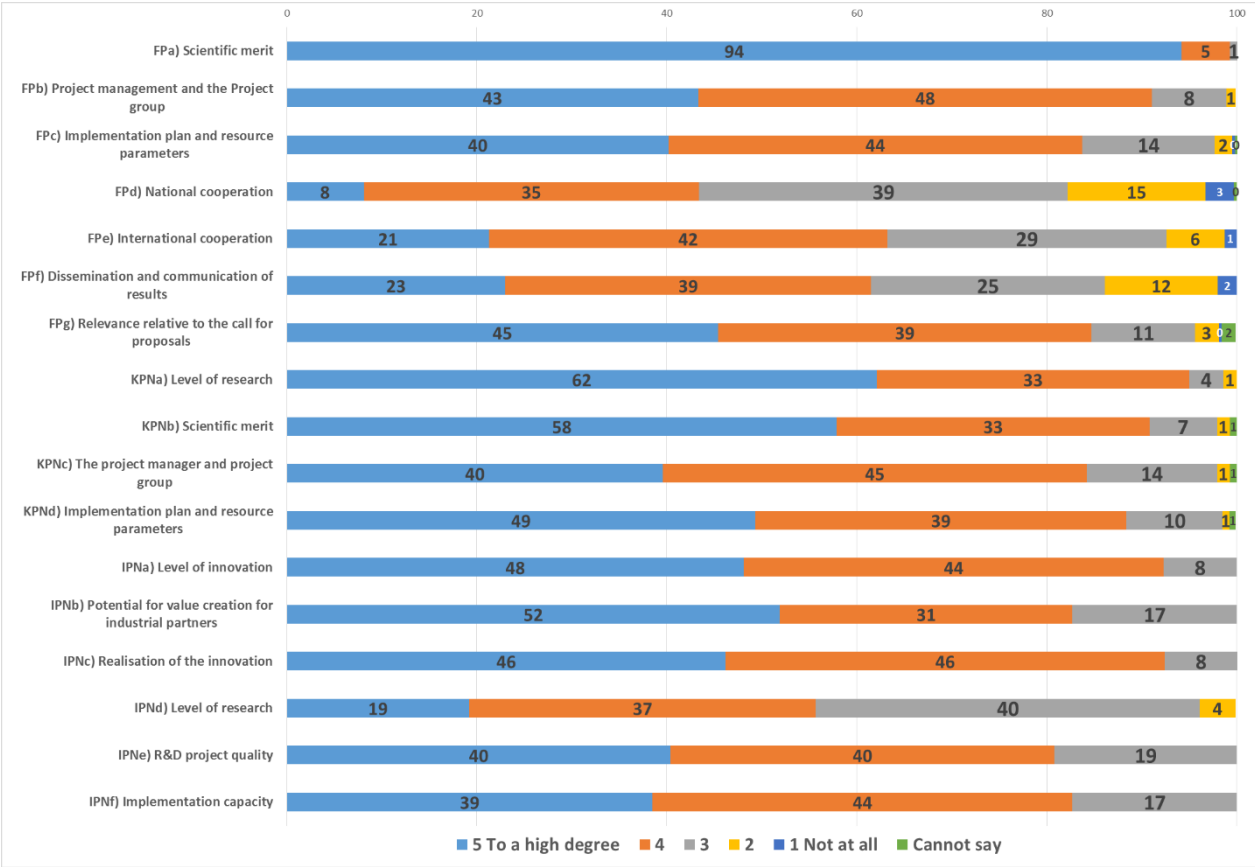
<sup>84</sup> This includes those who had reviewed at least 3 proposals for Researcher projects (as panel member), 1 KPN proposal (Knowledge-building Projects for Industry, as panel member or individual expert) or 1 IPN (Innovation Projects for the Industrial Industry, as panel member). Some of the reviewers had reviewed multiple types of proposals.

<sup>85</sup> Of the 995 reviewers in the full sample, failed delivery was reported for 23 of them when sending out the email invitation to the survey. Subtracting these 23 respondents from the sample, the adjusted response rate is 55 per cent of those who can be assumed to have received the invitation to participate.

<sup>86</sup> These are figures from the full sample, not subtracting the failed delivery.

Turning to the KPN and IPN criteria, we find that most of them come up with over 80 per cent reviewers who find them important or highly important (scoring 4 or 5). The only exception is 'Level of research' in the assessment of IPNs. This criterion indicates the 'extent to which the project will produce new knowledge of significance for the scientific development' (see Appendix 2). The criterion is the same for IPNs and KPNs, but as shown in Figure 3.3, the reviewers find this criterion far more important for KPNs (62 per cent highly important) than for IPNs (19 per cent highly important). The different rating indicates that the group of reviewers have understood the (different) main aims of these grant types (IPN aiming at R&D activity promoting innovation and KPN at competence development in the research community within topics crucial to the development of industry). Still, even if reviewers demonstrate such understanding, few KPN or IPN criteria seem defined in a way so that a large majority of the reviewers find them highly important. The IPN criterion with the largest proportion (52 per cent) scoring highly important (5) – 'Potential for value creation for industrial partners' – is given a middle rate (3, indicating neither important or unimportant) by 17 per cent of the reviewers (and 4 by the remaining).

**Figure 3.3** 'I think this is an important criterion when assessing FP/KPN/IPN projects'. Per cent.



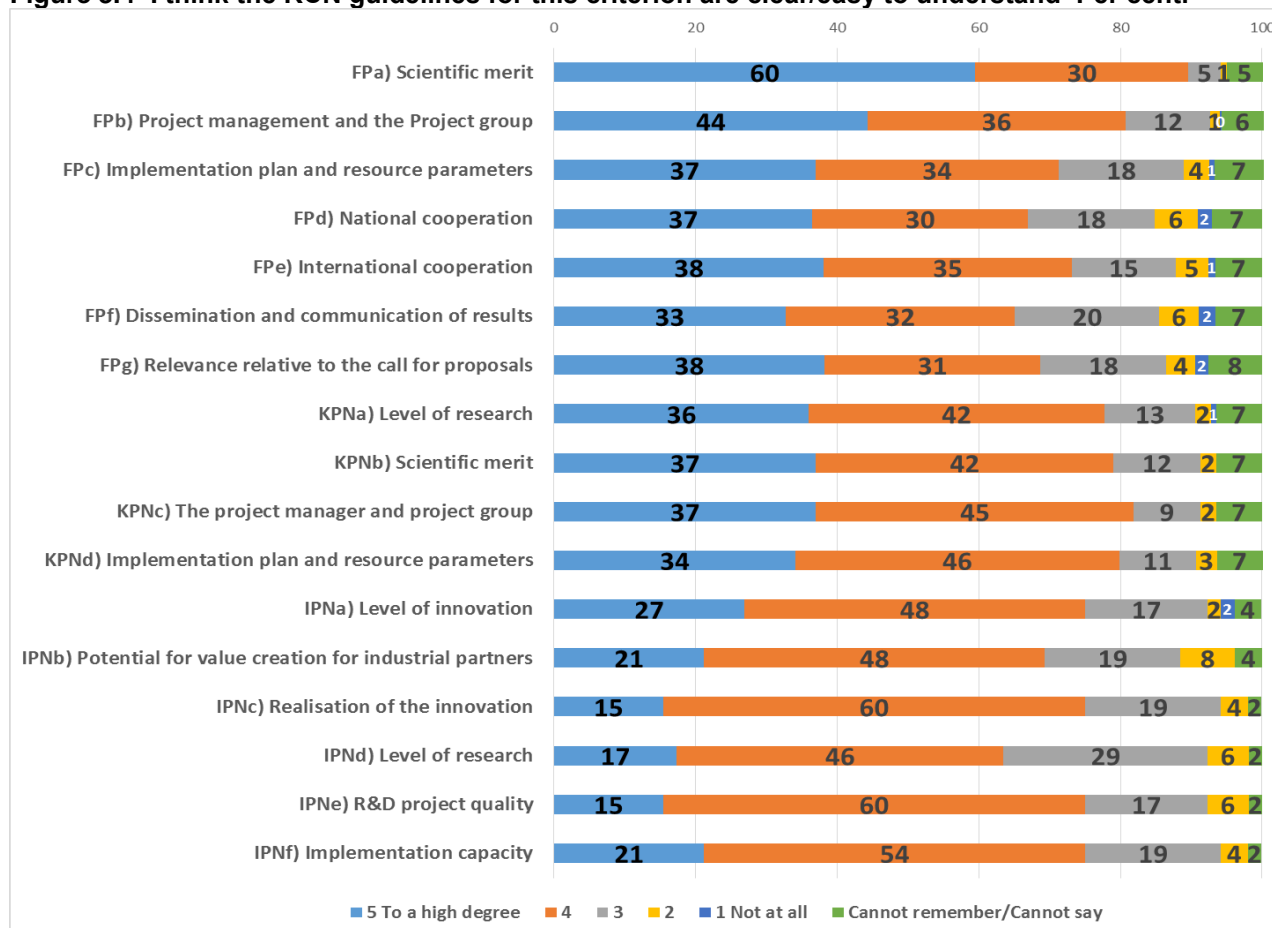
Source: Survey of RCN reviewers 2016. N=FP 393-396; KPN 138-140; IPN 52.

**The clarity of review criteria**

When asking the reviewers whether the guidelines for the criteria are clear/easy to understand, we see much the same pattern as for the importance of the criteria. The criteria which are found the most important are generally also the ones with highest degree of clarity, whereas those which are found less important are less clear. Scientific merit comes out as the most clear criterion (90 percent rating 4 or 5 on clarity), whereas some of the IPN criteria come out as the least clear. Again, we see a significant difference between IPN and KPN reviewers concerning the 'level of research' criterion. Only 17 per cent of the IPN reviewers give the highest rate on the clarity of this criterion, whereas 36 per cent of the KPN reviewers do so. The guidelines for this criterion are the same regardless of grant type. Hence, the likely explanation for the different scores would be that the criterion are not similarly

meaningful for both reviewer groups<sup>87</sup> and/or that the total set of criteria for the grant type impacts the clarity of the 'level of research'. The reviewer groups for the two types of grants differ considerably. The KPN reviewers are much the same as the reviewers for Researcher projects (scholars/researchers outside Norway), whereas the IPN reviewers are from a broader set of sectors (industry/public sector) and are mostly Norwegian (Table A9 and A10 in Appendix 1). We may assume that how to assess 'level of research' is less clear or obvious to the latter group. Moreover, the set of criteria for the IPN proposals are larger – there are more criteria to distinguish from each other – which may make the 'level of research' criterion less clear (it has to be distinguished from e.g. 'R&D project quality' and 'level of innovation').

**Figure 3.4 'I think the RCN guidelines for this criterion are clear/easy to understand' Per cent.**



Source: Survey of RCN reviewers 2016. N=FP 392-395; KPN 138-139; IPN 52.

There are only small differences across fields of research in the reviewers' rating of the clarity of the criteria. For the Researcher projects 'Scientific merit' comes up as the clearest criterion in all fields. 'Implementation plan and resource parameters' seem slightly less clear in the humanities than in other fields (average score 3.8 in the humanities, compared to a total score of 4.1 when including all fields). For the IPNs and KPNs there are too few reviewers in the individual fields of research to study differences (Table A11 in Appendix 1).

To some extent training, in terms of reviewing more proposals, increase the clarity of the criteria. For all the Researcher project criteria those who reviewed at least 3 Researcher projects far more often (than those who only reviewed 1 or 2 Researcher projects) give the highest rate on clarity (Table A12 in Appendix 1). The same is not the case for the KPN and IPN projects. Here there is less difference between the groups of experienced and less experienced reviewers, and for some criteria we find a

<sup>87</sup> In the survey, there are three respondents who have rated the criterion 'level of research' twice (as they have reviewed both IPN and KPN proposals). These give similar rate to this criterion regardless of grant type.

higher proposition of the highest clarity rate among the less experienced reviewers (Scientific merit; Level of research (for both IPN and KPN); Implementation plan and resource parameters; Potential for value creation for industrial partners (Table A13 and A14 in Appendix 1). Looking only at averages (and excluding those who cannot remember the clarity of guidelines, Table 3.8) we see that for IPN and KPN criteria, the average clarity scores given by the more and the less experienced reviewers are approximately the same. Still for three criteria, the averages are slightly higher for the least experienced reviewers. It should be added that differences are not significant. Still, there is the possibility that some criteria appear less clear for reviewers who have more training in using them and tried to interpret when assessing a variety of proposals.

**Table 3.7 'I think the RCN guidelines for this criterion are clear/easy to understand'. Average score by reviewer experience/number of reviewed proposals, 5 = To a high degree, 1 = Not at all.**

|   | Review min 3 proposals 2015* |     |      |    | Total |     |
|---|------------------------------|-----|------|----|-------|-----|
|   | Yes                          |     | No   |    | Mean  | N   |
| <b>Researcher project</b>                                 | Mean                         | N   | Mean | N  | Mean  | N   |
| 3a) Scientific merit                                      | 4,6                          | 354 | 4,1  | 21 | 4,6   | 375 |
| 3b) Project management and the Project group              | 4,3                          | 349 | 4,0  | 21 | 4,3   | 370 |
| 3c) Implementation plan and resource parameters           | 4,1                          | 345 | 4,0  | 21 | 4,1   | 366 |
| 3d) National cooperation                                  | 4,0                          | 345 | 3,7  | 19 | 4,0   | 364 |
| 3e) International cooperation                             | 4,1                          | 347 | 4,0  | 21 | 4,1   | 368 |
| 3f) Dissemination and communication of results            | 3,9                          | 345 | 4,0  | 21 | 3,9   | 366 |
| 3g) Relevance relative to the call for proposals          | 4,1                          | 342 | 3,8  | 21 | 4,1   | 363 |
| <b>KPN</b>  |                              |     |      |    |       |     |
| 7a) Level of research                                     | 4,0                          | 35  | 4,3  | 95 | 4,2   | 130 |
| 7b) Scientific merit                                      | 4,0                          | 34  | 4,3  | 95 | 4,2   | 129 |
| 7c) The project manager and project group                 | 4,3                          | 34  | 4,2  | 95 | 4,2   | 129 |
| 7d) Implementation plan and resource parameters           | 4,2                          | 34  | 4,2  | 95 | 4,2   | 129 |
| <b>IPN</b>  |                              |     |      |    |       |     |
| 11a) Level of innovation                                  | 4,0                          | 19  | 4,0  | 31 | 4,0   | 50  |
| 11b) Potential for value creation for industrial partners | 3,9                          | 19  | 3,8  | 31 | 3,9   | 50  |
| 11c) Realisation of the innovation                        | 3,9                          | 20  | 3,9  | 31 | 3,9   | 51  |
| 11d) Level of research                                    | 3,8                          | 20  | 3,7  | 31 | 3,8   | 51  |
| 11e) R&D project quality                                  | 3,9                          | 20  | 3,8  | 31 | 3,9   | 51  |
| 11f) Implementation capacity                              | 3,8                          | 20  | 4,0  | 31 | 3,9   | 51  |

Source: Survey of RCN reviewers 2016.

\*For the Researcher projects and the IPNs this include reviewers who reviewed at least three proposals as member of a review panel in 2015. For the KPNs it includes those who reviewed at least panel least three proposals in total, as member of a review panel or an individual reviewer.

### Importance and clarity compared to other funding agencies

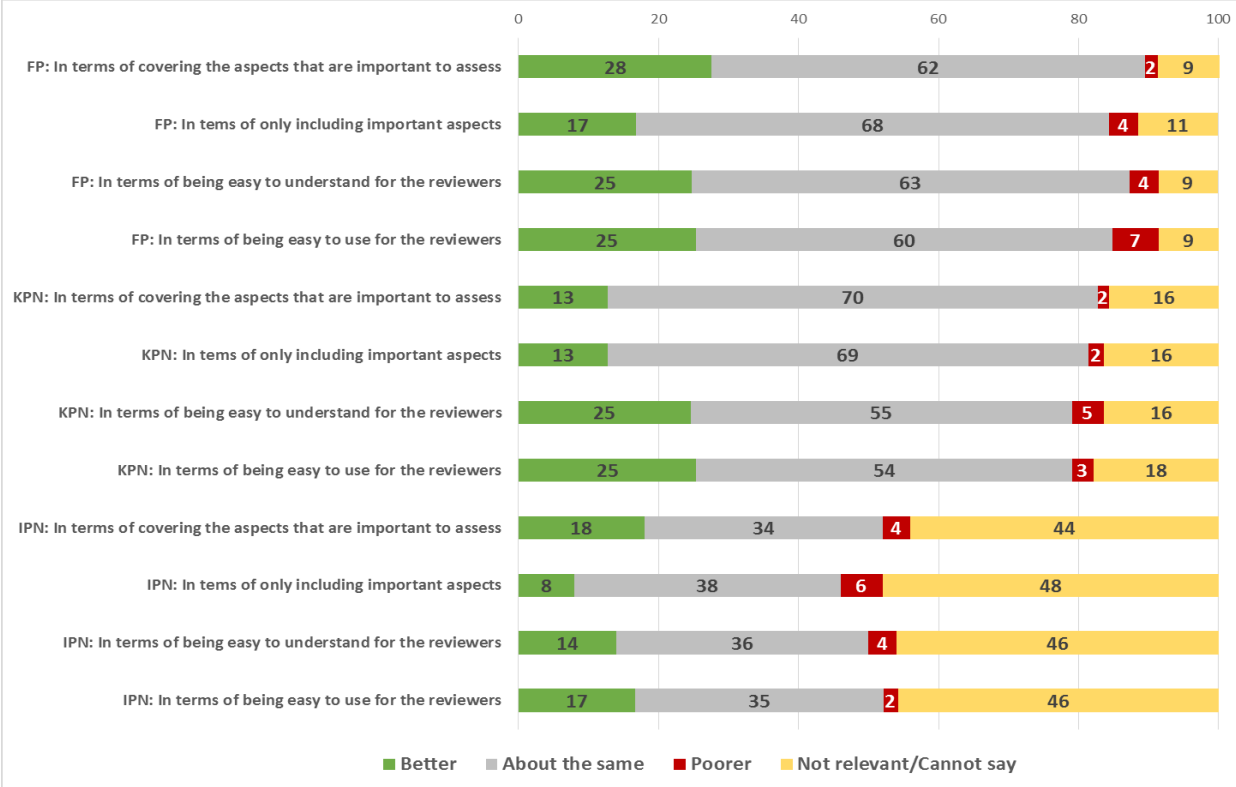
When asked to compare the RCN criteria with those used in other funding agencies they know, very few of the reviewers answer that they find other agencies to be better. The large majority answers that the RCN criteria are about as good as those used for similar applications in other funding agencies, or that they do not know.

Some differences appear between the three grant types and the aspects of the criteria compared. The Researcher projects and the IPNs come best out on comprehensiveness, but score far lower on focusing on important aspects. KPNs on the other hand, score equally good on the question concerning focus ('only including important aspects'), as on the question concerning comprehensiveness ('covering the aspects that are important to assess'). These differences may be linked to the number of criteria the reviewers are asked to assess and rate. Researcher projects and IPNs are rated on seven and six criteria respectively, whereas reviewers are asked to rate KPNs on only four criteria. It should be added that even if the RCN criteria do not come out equally good on focusing on important aspects as on comprehensiveness, very few think other agencies are better in this regard (Figure 3.5).

The RCN comes out quite good on the questions concerning whether the criteria are easy to understand and use for the reviewers. Both for understanding and use, 25 per cent of the respondents

find the Researcher project and KPN criteria better than those of other funding agencies they know. For IPNs, the percentage is somewhat lower, due to the large proportion answering that they do not know (these are mainly Norwegian experts and have less experiences with similar proposals for other funding agencies). The highest percentage of reviewers finding other agencies better, are found among those reviewing Researcher projects when asked to compare whether the criteria are easy to use (7 per cent answer that others are better). Notably, there are seven criteria to rate for Researcher projects (plus an independent overall rate), which is far more than we have seen in any of the other agencies we studied in this report (Figure 3.5).

**Figure 3.5** 'When comparing the RCN criteria for [Researcher projects/KPN/IPN] to those used for assessing similar applications in other funding agencies you know, are the RCN criteria better, about the same or poorer:



Source: Survey of RCN reviewers 2016. N=Researcher projects (FP) 386-388; KPN 134; IPN 48-50.

**Researcher project criteria: Reviewers' comments<sup>88</sup>**

More than half of those who had reviewed Researcher projects provided free text comments for the survey replies (in total there were 219 comments on the Researcher projects criteria). A substantial number (47) of the comments contained some praise of the RCN review process, e.g. that the guidelines are very clear and the process easy to follow, that the criteria are appropriate or more generally that the RCN system provides objective and fair assessment. Of those who commented on the clarity of the criteria and guidelines, some expressed that the criteria were unclear/needed improvement (25), some that the criteria were clear (12). More specifically, some were concerned that the criteria overlap (11):

- 'There was too much overlap between the criteria. I would suggest to work with a smaller scale and sharper distinctions between the criteria.'
- 'It was sometimes difficult to fully understand what should be assessed under which point. But the person from RCN was very helpful to point this out, which was good.'

<sup>88</sup> Regardless of grant types, some reviewers comment that it is hard to recall the review process and answer questions several months after the work was done.

- 'b) Project management and the Project group c) Implementation plan and resource parameters: they might be merged into one criterium as they both linked to the management. I found it is difficult to evaluate those separately.'
- 'The criteria with respect to the overall project assessment, particularly in respect of project manager & team were somewhat contradictory as the overall assessment made assumptions as regards the quality of these.'

Moreover, respondents commented on the rating scale and the weighting of criteria (28), the electronic interface for reviewers (12), and provided suggestions for improving the application form/giving better guidance to applicants (13), such as providing more standardised information in the proposals (standardised CVs in particular).

Concerning the specific criteria, a substantial number commented on the (national/international) cooperation criteria (28) and/or 'Dissemination and communication of results' (20), i.e. three criteria which come out as the least important when scored by the reviewers (Figure 3.3 above):

- 'I thought the criteria for international and national cooperation were pointless to be honest, you either have a strong research group or not. The national cooperation seemed extremely 'false' and 'contrived', there may be no relevant collaborators in your own country but you would score poorly.'
- 'The guidance could be more explicit about what is looked for in national and international cooperation and when it is essential rather than nice to have.'
- 'The national and international cooperation criteria are very odd. Why do they matter if the science is excellent, the project team is an excellent fit to the topic, and the results are being disseminated properly. All the criteria seemed to achieve was inflation of the cost of the grants and size of the project team, with lots of people randomly added onto the grant just to hit the criteria, not because they were needed for delivering high quality science.'
- "'National cooperation" is hard to assess for a foreigner, I found. I also find it difficult to rate "dissemination" as most proposals are pretty standard in that regard and there is little room for originality. As a reviewer I would say fewer items would make our life easier.'
- 'The point on "Dissemination and communication of results" is difficult to quantitate and the guidelines give very little instruction on how do the evaluation. Some applicants more or less duplicate their institution's standard phrasing for this point; is that better or worse than the more mixed compilation of thoughts other applicants write? More defined guidelines for applicants and reviewers are needed, or the point should be delegated to administrator to evaluate similar to the formal requirements for applying for a given funding source. Likewise, the point on "National cooperation" is vague: How much is requested, and is it equally good to collaborate between a medical and a natural science faculty within one university as collaborating between two universities at two different physical locations?'
- 'I have answered "Not at all" for importance of categories ©-(f), not because effective organisation, collaboration and dissemination is not important, but because they from part of scientific merit. ... Requiring only one score (overall quality) per application, requiring comments on organisation, collaboration, dissemination etc. would be a major improvement.'

### **KPN criteria: Reviewers' comments**

Of the 46 respondents who commented on the KPN criteria, 20 stated that the criteria were clear/easy to apply or that they were generally satisfied (or even impressed by the RCN review procedure). On the other hand, 14 respondents stated that the criteria or guidelines in some way were unclear or should be improved. The difficulties commented on, include on the one hand that some criteria are difficult to separate, on the other hand that some criteria include multiple aspects:

- 'Sometimes it was not so easy to separate between level of research and scientific merit.'

- 'many aspects could be understood differently by the panel members as to which criterion they would belong to. It should be made very clear where e.g. the scientific competence of a single member of the project team should be counted in'
- 'There are criteria (e.g. scientific merit) that must be assessed in relation to several points. It would be better to have more explicit criteria to assess in connection to as few points as possible.'

Other issues commented on included: additional aspects/criteria to be added (transferability and use of the knowledge by the industry; feasibility of market take up); that using the RCN rating scale is time-consuming; the panel discussion (mostly positive comments); that the reviewers would like more information on the call and the result/funding decisions; the electronic interface for reviewers.

### **IPN criteria: Reviewers' comments**

The IPN reviewers constitute the smallest respondents group, and only a minority (15) of them provided free text comments. No topics dominate these comments. Some state they were satisfied (or even impressed) by the RCN review process, others would like improvements in criteria or better guidelines, e.g. criteria for predicting feasibility, and clearer guidelines/definition of level of innovation and level of research. A few examples:

- 'In general, I think the criteria for the assessment were good and clear. The R&D project quality is important, and there could be room for some improvement with respect to this issue.'
- 'Criteria for predicting/evaluating feasibility are lacking.'
- 'I think often that the reviewers themselves has not sufficiently learned the criteria, and often they start giving scores with[out] a proper understanding of the difference scales that the criteria expresses. On the basis of the criteria, I often feel that projects are over-rated.'

### **Main findings from the RCN reviewer survey**

- From the point of the reviewers, there are large differences in the importance of the RCN review criteria. Some are rated as highly important by a large majority of the reviewers, others only by a minority. Ideally, a large part of the reviewers should find the criteria they apply highly important, otherwise there is reason to believe that the criteria are not clearly understood and well defined, or that one has not found the correct group of experts to perform the reviews. Notably, the RCN operate without explicit rules for weighting the criteria, and the result may give some indication of the criteria's relative importance in the review of the three grant types included in the survey (Researcher projects, KPN and IPN).
- When asking the reviewers about the clarity of the criteria, we see much the same pattern as for the importance of the criteria: The criteria which are found the most important are generally also the most clear, whereas those which are found less important are less clear.
- In the survey replies, some reviews comment on overlap between criteria (and some suggest to merge criteria), and some explain why they have answered that some of the criteria are not particularly important. Still, the general picture is that the reviewers find the RCN criteria clear and important, and they seem quite satisfied with the criteria. Most of them find that the RCN criteria are as good as, or better than, those of other funding agencies they know, both in terms of importance and clarity.



# 4 Conclusions and recommendations

## 4.1 Key findings

In this report we have looked at different ways of customising and harmonising funding instruments and review criteria, and compared funding agencies on these issues. Key findings are summarised below.

### 4.1.1 *Portfolio and structure of funding instruments*

In previous studies on research funding instruments we see a variety of types and levels of categories of funding instruments, reflecting the wide scope of aims, target groups and different needs and preferences concerning research funding. There is no standard way of categorising these funding instruments, and terminology is developed specifically for this study (definitions in Section 2.1.1).

In addition to a wide variety between funding agencies, each agency often offers a broad and heterogeneous portfolio of funding schemes. From the point of view of the researchers, funding instruments may be greatly differentiated, while at the same time not covering their needs, needs which may depend on their field of research, career stage or sector. Moreover, there seems to be a limited match between researchers' grants and their lines of research – it often takes multiple grants to fund what for a research group is the same project. From the point of view of the funding agency, a multitude of funding schemes and categories may imply challenges in efficiently operating and coordinating their funding schemes, while it may be difficult to serve all missions and policy aims within a limited set of funding schemes and categories.

*Standardising grant types* across funding schemes/programmes is one way of pursuing harmonisation and simplicity in funding instruments, while still operating a portfolio of funding schemes serving a broad scope of policy aims, target groups and needs. Among the studied funding agencies, H2020, NSF and RCN have grant types used across funding schemes/programmes – in all cases providing overview and standardisation in a large and mixed set of funding instruments. Notably, the RCN has a large set of grant types, as well as a large residual/open category ('other support'), reducing the level of standardisation obtained compared to H2020 and the NSF.

The four other funding agencies included in the study have either a small number of funding schemes and no need of grant types across schemes (the ERC), or terms and conditions are (more or less) common across funding schemes without (explicitly) being defined as standard grant types (VINNOVA, NWO, NERC).

The mapping displays a variety of ways in which the agencies structure and standardise their funding instruments. Notably, the mapping shows that whereas the funding agencies often offer the same

types of funding (according to the ESF types used for the mapping in this report), some cover the categories with separate funding schemes and others with grant types across their funding schemes. For example, the RCN funding for centres are separate schemes (SFF, SFI and FME), whereas the NSF centre funding is a type used across schemes. More generally, it may be difficult to determine what is a 'grant type' and what are other ways of standardising terms and conditions across funding schemes and programmes, and the lack of common terms and categories for describing the structure of funding instruments for research, complicates these kinds of comparisons across funding agencies.

#### **4.1.2 Review criteria**

*Three main dimensions of research quality:* While the definitions of research quality differ within the research community, there are nevertheless some common dimensions of research quality: (1) Solidity/plausibility/methods, (2a) scientific and (2b) societal significance and (3) originality. There is no standard way of setting up and structuring grant review criteria from such common dimensions. In addition to the general dimensions, feasibility and clarity are often particular concerns when assessing grant proposals. These may be seen as separate dimensions or sub-criteria to solidity/plausibility/methods. Moreover, compliance to general requirements concerning research ethics, diversity/gender balance and sustainability may be specific concerns in assessing societal significance or they may be assessed separately. Furthermore, the proposed research, the applicant and the research environment may be assessed separately, and add to the number of relevant review criteria.

*Tailored vs. open criteria:* Review criteria may be defined on a general level, leaving much discretion to the reviewers (and so criteria may be applied across funding schemes), or they may be more specified and tailored to specific funding schemes and their objectives. In defining criteria, the relevant considerations and choices are much along the same lines as in designing funding instruments: There is a need to take into consideration both the need for simplicity and clarity for the reviewers and applicants, and the need for diversity and tailoring to specific funding schemes/aims and fields of research.

*The trend is specified criteria and adding social impacts:* In the last decades, there has been increased emphasis on defining and specifying grant review criteria. Moreover, there has been an increased focus on societal impacts in the review of grant proposals, with a variety of different approaches for assessing potential impacts. The literature does not give clear answers concerning the effects of, or need for, detailed review guidelines and criteria.

*The number of review criteria:* There is large variation between the mapped funding agencies when it comes to number and diversity of review criteria. Most agencies operate with review criteria that cover most of the five general dimensions identified in this study<sup>89</sup>, but in different ways. In some cases, one review criterion (understood as what is rated separately) covers several dimensions. For example, the one rate given to NSF proposals is to cover all five dimensions. In other agencies (with the exception of NERC's Discovery Science schemes), there are more separate rates, some covering one dimension, some covering multiple dimensions. ERC has one overall criterion (Excellence), which is rated separately for the proposed research and the applicant/PI in the first stage of the review, and then given one overall rate by the panels. The only examples with multiple rates for one dimension are found in RCN. The RCN also has the highest number of separately rated criteria (depending on grant type, up to 17 rates per proposal).

*The standardisation of review criteria:* The studied agencies have different approaches to standardising review criteria. The majority of the funding agencies operate with a limited number of standard review criteria, combined with some flexibility: NERC and NSF apply one general/key criterion across (nearly all) their funding schemes, and add additional aspects for particular schemes/categories of schemes. ERC's one overall criterion is moderately adapted to the three main grant types. H2020 and VINNOVA each have three overall criteria that are adapted to the individual

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<sup>89</sup> Originality; Feasibility/methods; Scientific and Broader Significance/impacts; the Applicant; the Research environment.

schemes/calls for proposals (issues/sub-criteria to be included for the different schemes). Differently from this, the RCN has a large number of standardised criteria (41), and each funding instrument/type of grant use a defined set of these criteria. Finally, the NWO has a limited number of review criteria per funding scheme, but little explicit standardisation across schemes: There are two general aspects/criteria across funding schemes (scientific quality and knowledge utilisation), combined with considerable flexibility and adaptability to the individual schemes, and no general definitions of the cross-cutting criteria.

Summing up the results from our limited mapping, clustering the aspects to be assessed into a few overall criteria to be rated, seems more common than a detailed lists of aspects to be assessed and rated separately. All the agencies have specified review criteria and guidelines for reviewers, but in most cases reviewers only rate the proposals according to 1-3 (main) criteria.

### **4.1.3 Stakeholders' concerns and experiences**

*Transparency and communication* to applicants is important, and all the studied agencies provide extensive information on their funding instruments and review criteria on their web-pages. Categories of funding schemes, and when relevant grant types across schemes, are explained to potential applicants searching for funding opportunities, and eligibility, funding terms and conditions and review criteria are explained in common guidelines for applicants and/or in the individual calls for proposals. In some cases, review forms and/or reviewer guidelines are easily available to applicants (for H2020 and ERC as a self-evaluation form); in other cases the applicants must do more advanced searches to find the forms, or wait until receiving the result of the review.

*Concerns for simplification and flexibility:* In several of the studied funding agencies, there are ongoing reviews/restructuring of instruments or procedures, aiming at streamlining/simplification and/or improving flexibility. In NERC, concerns in ongoing discussions include opportunities for more standardisation, streamlining and simplification of NERC activities, as well as ensuring flexibility. In NWO there are reorganisation plans which include streamlining and standardisation of funding instruments, and plans for increased harmonisation of criteria. In VINNOVA, main goals include streamlining and reduction in management workload. Notably, with the exception of NWO, which at present operates with a limited degree of standardisation of criteria, these ongoing processes do not include revision of the review criteria. The improvement and clarification of criteria may still be part of continuous developments, as in the ERC where the sub-questions to reviewers can be somewhat modified from year to year based on input from (previous year's) review panels and from the Scientific Council.

*Criteria, rates and ranking:* Another question is the need for reviewers to rate criteria individually. In the mapping exercise of this report a criterion is a dimension of the assessment that is given a separate rate, and may include several sub-questions/sub-criteria (which are not rated separately). Separate rates for different aspects give the possibilities for more standardised ranking procedures, based on e.g. fixed rules for the relative weights of the criteria, and/or defined thresholds for each of them. Part of the differences between the agencies when it comes to review criteria, reflects different views on the benefits of such standardised procedures. In general, the NSF does not see separate rates for each of their two criteria ('Intellectual merit' and 'Boarder impacts') as needed or desired. Reviewers may apply rates differently, interpreting and comparing ratings is a complex task, and here the discretion of the programme officers and the content and arguments of the reviews are seen as more important than e.g. quantifiable average rates. Likewise, NERC finds that ranking based on averages of the scores on the different criteria make little sense, as the rating scale is often used differently, and emphasises that the review comments are important when ranking the proposals. In the H2020 (apart from ERC) on the other hand, standardisation and transparency are emphasised, and there are fixed weights and thresholds for each of the three criteria and fixed rules for ranking when multiple proposals end up with the same review score. Such standardisation implies less room for discretion in the review and presumably less time-consuming panel discussions.

## Challenges in the RCN review criteria

*The applicants' concerns:* In this report, we have looked particularly on the criteria applied for the review of proposals to RCN. In the comparative study, RCN prevails with the longest list of review criteria. In surveys for past evaluations, some RCN applicants comment that RCN has too many criteria and that there should be clearer focus in the review of proposals, that criteria are unclear, and/or that there appear to be too much focus on factors that should not be major concerns in the review (criteria of little relevance). The comments may indicate that the large number of criteria, and lacking information on how they are weighted or their role in the different phases of the review process, is a source of discontent among applicants – who would like more transparency in the review and more focus on what they consider the most important criteria.

*From the point of the RCN reviewers,* there are large differences in the importance of the RCN review criteria. Our survey among experts who have reviewed RCN proposals shows that some criteria are rated as highly important by the large majority of the reviewers, others only by a minority. When the reviewers are asked about the clarity of the criteria, much the same pattern appears as for the importance of the criteria: The criteria which are found the most important are generally also the clearest, whereas those which are found less important are less clear. In the survey replies, some reviewers comment on overlap between criteria (and some suggest to merge criteria), and some explain why they have answered that some of the criteria are not particularly important. Still, the general picture is that the reviewers find the RCN criteria clear and important, and they seem quite satisfied with the criteria. Most of them find that the RCN criteria are as good as, or better than, those of other funding agencies they know, both in terms of importance and clarity.

In sum, there are some perceived challenges in using the RCN review criteria, some of which derive from the large set of customised criteria partly addressing overlapping aspects. In some cases, the list of criteria is long and there is no information (or rules) concerning their relative weighing. Both delimiting which aspects belong under which criterion and understanding what is emphasised, may be difficult.

## 4.2 Improving simplicity and flexibility in RCN grant types and criteria

A key question for funding agencies with multiple and broad missions, like the RCN, is how to balance the need for customising funding instruments and review criteria to specific aims and target groups, with the need for simplicity and coherence as well as flexibility.

*Funding instruments:* There is an ongoing process in the RCN to improve and streamline processes to increase i.a. efficiency, simplicity and transparency. The RCN operates with a large set of standardised grant types across its funding schemes. Still, a large part of RCN grants does not fit any of the standard types (residual category of 'other support'), indicating a need for better customisation and/or increased flexibility. Issues being discussed include revision/simplification of the grant types, e.g. by making them more flexible/open and reducing the need for the 'other support' category.

*Review criteria:* For the RCN review criteria, transparency and simplicity are limited. The RCN handle a highly differentiated set of review criteria, covering the various objectives of a large number of funding instruments. For most grant types a considerable number of criteria – which may address some of the same aspects – are to be rated, and review forms can be quite complex, limiting clarity and simplicity for the reviewers. Transparency and simplicity for applicants are also limited, as there are long lists of criteria not explaining/emphasising the main concerns, or explaining which criteria are rated at the different stages of the review process.

There are both benefits and drawbacks in using a small, fixed set of general funding instruments/grant types and review criteria – compared to a larger set of customised instruments and criteria.

*Fixed, general grant types* provide simplicity and streamlining, including terms and conditions that are recognisable across calls and funding schemes and may considerably reduce the administrative workload of the funding agency. For the researchers, more general funding instruments may increase the flexibility in designing research projects, and reduce administrative costs and the need for multiple grants for one project. On the other hand, such standards reduce flexibility and the possibility of customising funding instruments to specific types of funding or target groups. Fixed categories may not fit all policy aims, and may add unnecessary restrictions to programme development. In general, when managing a large portfolio of funding schemes, standardised grant types across funding schemes ease administrative procedures, and provide better overview and clarity to applicants. Still for the RCN, with one third of proposals in a residual open category ('other support') as well as a considerable number standard grant types, these kinds of benefits from grant types are more limited than in the other studied agencies. *In sum, there is a need for a revision of the RCN grant types.* The obvious aim is a good balance between the standardisation and flexibility in the RCN funding instruments, addressing the needs of both the RCN and the research community. Possible ways to reduce the large proportion of 'other support', may include a smaller set of 'general' grant types which can be adapted to individual funding schemes and to the calls for proposals (e.g. by adjusting eligibility terms, funding requirements, and/or review criteria). The ESF categories of funding instruments (see Section 2.1.1.) may serve as a starting point when considering what needs to be a separate grant type.

*A small set of fixed, general review criteria* provides simplicity, overview and clarity in what is emphasised, may be easier to apply for the reviewers, and the applicants may better understand the focus of the assessments. On the other hand, fixed criteria limit the possibilities to ensure that all important aspects are assessed/included in the overall assessments, and may therefore pose restrictions on the follow-up on programme objectives. Fewer criteria also limit the possibilities for standardised ranking procedures based on fixed weighting or thresholds for each criterion. Several of the studied agencies have solved this by adapting guidelines/sub-criteria to the individual funding schemes (or grant type) and demanding substantial comments on each aspects/sub-criteria (but not demanding separate rates). Notably, none of the studied agencies operate with weighting or thresholds by sub-criteria (but some do this for main criteria), and several are generally critical to standardised ranking procedures. *In sum, a small set of cross-cutting, adaptable review criteria seem a simple, efficient and stable solution in several agencies, and should be considered by the RCN in their revision of review criteria, as a well-tested way to combine standardisation and flexibility.*

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## Appendix 1 Tables

**Table A 1 Researchers' motives to apply for RCN grants. Percentages.**

| In general, how important are the following motives when you apply for grants from the Research Council of Norway (RCN)? | Important motive to apply for RCN grants | Partly/sometimes a motive to apply for RCN grants | No, this is not important in my research projects | No, no RCN scheme would be helpful in achieving this | Cannot say | N   |
|--|--|---|---|--|------------|-----|
| a) Get funding for my own research activities  | 78.3                                     | 14.1  | 4.0   | 0.9  | 2.7        | 669 |
| b) Get funding for recruitment positions to my institution   | 52.5                                     | 30.5  | 8.3   | 3.1  | 5.7        | 653 |
| c) Gain access to complementary expertise  | 22.1                                     | 39.0  | 21.9  | 5.6  | 11.3       | 638 |
| d) Gain access to scientific excellence  | 24.6                                     | 36.5  | 18.0  | 8.7  | 12.3       | 635 |
| e) Create new national research networks   | 29.6                                     | 43.5  | 14.6  | 4.3  | 8.0        | 646 |
| f) Create new international research networks  | 37.7                                     | 39.4  | 10.4  | 4.7  | 7.8        | 653 |
| g) Strengthen existing national research networks  | 32.9                                     | 43.7  | 13.0  | 2.3  | 8.1        | 645 |
| h) Strengthen existing international research networks   | 36.1                                     | 42.2  | 11.1  | 3.4  | 7.2        | 640 |
| i) Create or strengthen collaboration with industry  | 17.3                                     | 23.0  | 38.7  | 8.8  | 12.3       | 626 |
| j) Broaden our field of expertise  | 40.5                                     | 36.6  | 12.7  | 4.0  | 6.3        | 632 |
| k) Conduct scientifically/ technologically risky research  | 21.0                                     | 18.3  | 37.2  | 10.8   | 12.7       | 623 |
| l) Conduct cross-sector research   | 17.9                                     | 32.1  | 32.1  | 6.4  | 11.5       | 626 |
| m) Conduct interdisciplinary research  | 29.3                                     | 43.1  | 16.9  | 4.1  | 6.6        | 634 |
| n) Conduct research in collaboration with key international institutions   | 34.7                                     | 39.6  | 14.5  | 3.7  | 7.6        | 629 |
| o) Prepare for participation in international funding programmes   | 19.0                                     | 39.2  | 25.4  | 4.8  | 11.6       | 627 |

Source: Langfeldt et al. 2012, Table 2.1, page 10. NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. The question was posed to researchers who indicated that they had applied for RCN grant at least once in the period 2003 to 2011.

**Table A 2 Researchers' motives to apply for RCN grants by field of research. Percentages.**

| In general, how important are the following motives when you apply for grants from the Research Council of Norway (RCN)? |  |  |   |  |             |            |  |
|--|--|--|---|--|-------------|------------|--|
| Motive/Field of research   | Important motive to apply for RCN grants | Partly/ sometimes a motive to apply for RCN grants | No, this is not important in my research projects | No, no RCN scheme would be helpful in achieving this | Cannot say  | N          |  |
| <b>a) Get funding for my own research activities</b>   |  |  |   |  |             |            |  |
| Humanities   | 77.4                                     | 20.2   | 1.2   | 1.2  | 0.0         | 84         |  |
| Natural sciences   | 82.4                                     | 10.5   | 3.9   | 0.7  | 2.6         | 153        |  |
| Medical sciences   | 79.1                                     | 11.0   | 3.3   | 1.1  | 5.5         | 91         |  |
| Social sciences  | 73.0                                     | 13.8   | 7.2   | 2.0  | 3.9         | 152        |  |
| Engineering sciences   | 83.7                                     | 12.0   | 3.3   | 0.0  | 1.1         | 92         |  |
| Agriculture and fishery  | 76.3                                     | 16.9   | 5.1   | 0.0  | 1.7         | 59         |  |
| Multiple areas, other  | 73.0                                     | 24.3   | 0.0   | 0.0  | 2.7         | 37         |  |
| <b>Total</b>   | <b>78.3</b>                              | <b>14.1</b>  | <b>4.0</b>  | <b>0.9</b>   | <b>2.7</b>  | <b>668</b> |  |
| <b>b) Get funding for recruitment positions to my institution</b>  |  |  |   |  |             |            |  |
| Humanities   | 64.6                                     | 21.5   | 5.1   | 2.5  | 6.3         | 79         |  |
| Natural sciences   | 51.6                                     | 35.9   | 5.2   | 3.3  | 3.9         | 153        |  |
| Medical sciences   | 65.2                                     | 20.2   | 4.5   | 2.2  | 7.9         | 89         |  |
| Social sciences  | 44.8                                     | 39.3   | 9.7   | 2.1  | 4.1         | 145        |  |
| Engineering sciences   | 44.4                                     | 22.2   | 16.7  | 7.8  | 8.9         | 90         |  |
| Agriculture and fishery  | 45.8                                     | 33.9   | 15.3  | 0.0  | 5.1         | 59         |  |
| Multiple areas, other  | 62.2                                     | 29.7   | 0.0   | 2.7  | 5.4         | 37         |  |
| <b>Total</b>   | <b>52.6</b>                              | <b>30.4</b>  | <b>8.3</b>  | <b>3.1</b>   | <b>5.7</b>  | <b>652</b> |  |
| <b>e) Create new national research networks</b>  |  |  |   |  |             |            |  |
| Humanities   | 41.0                                     | 39.7   | 9.0   | 3.8  | 6.4         | 78         |  |
| Natural sciences   | 31.8                                     | 48.3   | 11.9  | 2.6  | 5.3         | 151        |  |
| Medical sciences   | 25.3                                     | 35.6   | 16.1  | 4.6  | 18.4        | 87         |  |
| Social sciences  | 28.3                                     | 40.0   | 17.9  | 4.1  | 9.7         | 145        |  |
| Engineering sciences   | 24.7                                     | 48.3   | 18.0  | 5.6  | 3.4         | 89         |  |
| Agriculture and fishery  | 20.7                                     | 51.7   | 13.8  | 5.2  | 8.6         | 58         |  |
| Multiple areas, other  | 37.8                                     | 40.5   | 10.8  | 8.1  | 2.7         | 37         |  |
| <b>Total</b>   | <b>29.6</b>                              | <b>43.6</b>  | <b>14.4</b>                                       | <b>4.3</b>   | <b>8.1</b>  | <b>645</b> |  |
| <b>f) Create new international research networks</b>   |  |  |   |  |             |            |  |
| Humanities   | 55.6                                     | 28.4   | 4.9   | 4.9  | 6.2         | 81         |  |
| Natural sciences   | 35.3                                     | 46.7   | 8.7   | 4.7  | 4.7         | 150        |  |
| Medical sciences   | 31.4                                     | 31.4   | 12.8  | 8.1  | 16.3        | 86         |  |
| Social sciences  | 35.6                                     | 38.9   | 12.8  | 5.4  | 7.4         | 149        |  |
| Engineering sciences   | 33.3                                     | 44.4   | 12.2  | 2.2  | 7.8         | 90         |  |
| Agriculture and fishery  | 37.9                                     | 31.0   | 17.2  | 5.2  | 8.6         | 58         |  |
| Multiple areas, other  | 39.5                                     | 55.3   | 0.0   | 0.0  | 5.3         | 38         |  |
| <b>Total</b>   | <b>37.6</b>                              | <b>39.4</b>  | <b>10.4</b>                                       | <b>4.8</b>   | <b>7.8</b>  | <b>652</b> |  |
| <b>i) Create or strengthen collaboration with industry</b>   |  |  |   |  |             |            |  |
| Humanities   | 5.7                                      | 8.6  | 64.3  | 8.6  | 12.9        | 70         |  |
| Natural sciences   | 18.4                                     | 24.5   | 40.1  | 8.8  | 8.2         | 147        |  |
| Medical sciences   | 6.0                                      | 22.9   | 33.7  | 14.5   | 22.9        | 83         |  |
| Social sciences  | 3.5                                      | 14.9   | 53.2  | 12.8   | 15.6        | 141        |  |
| Engineering sciences   | 53.3                                     | 33.3   | 7.8   | 0.0  | 5.6         | 90         |  |
| Agriculture and fishery  | 24.6                                     | 38.6   | 24.6  | 1.8  | 10.5        | 57         |  |
| Multiple areas, other  | 13.5                                     | 24.3   | 37.8  | 13.5   | 10.8        | 37         |  |
| <b>Total</b>   | <b>17.3</b>                              | <b>22.9</b>  | <b>38.7</b>                                       | <b>8.8</b>   | <b>12.3</b> | <b>625</b> |  |
| <b>o) Prepare for participation in international funding programmes</b>  |  |  |   |  |             |            |  |
| Humanities   | 24.7                                     | 37.0   | 21.9  | 1.4  | 15.1        | 73         |  |
| Natural sciences   | 21.8                                     | 38.1   | 24.5  | 6.1  | 9.5         | 147        |  |
| Medical sciences   | 20.5                                     | 30.1   | 19.3  | 7.2  | 22.9        | 83         |  |
| Social sciences  | 9.9                                      | 37.3   | 35.9  | 6.3  | 10.6        | 142        |  |
| Engineering sciences   | 22.7                                     | 48.9   | 19.3  | 1.1  | 8.0         | 88         |  |
| Agriculture and fishery  | 19.6                                     | 41.1   | 26.8  | 7.1  | 5.4         | 56         |  |
| Multiple areas, other  | 16.2                                     | 51.4   | 21.6  | 0.0  | 10.8        | 37         |  |
| <b>Total</b>   | <b>18.8</b>                              | <b>39.3</b>  | <b>25.4</b>                                       | <b>4.8</b>   | <b>11.7</b> | <b>626</b> |  |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012.

**Table A 3 Researchers' motives to apply for RCN grants by type of RCN funding scheme. Percentages.**

| In general, how important are the following motives when you apply for grants from the Research Council of Norway (RCN)? |  |   |   |  |            |            |
|--|--|---|---|--|------------|------------|
| Motive/Type of funding scheme*   | Important motive to apply for RCN grants | Partly/sometimes a motive to apply for RCN grants | No, this is not important in my research projects | No, no RCN scheme would be helpful in achieving this | Cannot say | N          |
| <b>a) Get funding for my own research activities</b>   |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 86.6                                     | 9.0   | 4.5   | 0.0  | 0.0        | 67         |
| Large-scale programme  | 82.4                                     | 16.2  | 1.5   | 0.0  | 0.0        | 68         |
| Centre Scheme (SFF/SFI/FME)  | 81.3                                     | 18.8  | 0.0   | 0.0  | 0.0        | 16         |
| User-directed programme  | 82.9                                     | 14.6  | 2.4   | 0.0  | 0.0        | 41         |
| Policy-oriented programme  | 86.4                                     | 11.9  | 1.7   | 0.0  | 0.0        | 59         |
| Other funding scheme   | 80.0                                     | 12.5  | 2.5   | 0.0  | 5.0        | 40         |
| <b>Total</b>   | <b>83.8</b>                              | <b>13.1</b>                                       | <b>2.4</b>  | <b>0.0</b>   | <b>0.7</b> | <b>291</b> |
| <b>b) Get funding for recruitment positions to my institution</b>  |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 66.7                                     | 24.2  | 6.1   | 0.0  | 3.0        | 66         |
| Large-scale programme  | 50.7                                     | 32.8  | 11.9  | 1.5  | 3.0        | 67         |
| Centre Scheme (SFF/SFI/FME)  | 31.3                                     | 56.3  | 0.0   | 0.0  | 12.5       | 16         |
| User-directed programme  | 43.9                                     | 34.1  | 14.6  | 4.9  | 2.4        | 41         |
| Policy-oriented programme  | 56.1                                     | 35.1  | 7.0   | 0.0  | 1.8        | 57         |
| Other funding scheme   | 61.5                                     | 25.6  | 7.7   | 2.6  | 2.6        | 39         |
| <b>Total</b>   | <b>54.9</b>                              | <b>31.8</b>                                       | <b>8.7</b>  | <b>1.4</b>   | <b>3.1</b> | <b>286</b> |
| <b>e) Create new national research networks</b>  |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 25.8                                     | 40.9  | 21.2  | 3.0  | 9.1        | 66         |
| Large-scale programme  | 29.2                                     | 55.4  | 12.3  | 1.5  | 1.5        | 65         |
| Centre Scheme (SFF/SFI/FME)  | 25.0                                     | 56.3  | 12.5  | 6.3  | 0.0        | 16         |
| User-directed programme  | 36.6                                     | 51.2  | 7.3   | 2.4  | 2.4        | 41         |
| Policy-oriented programme  | 32.8                                     | 48.3  | 13.8  | 1.7  | 3.4        | 58         |
| Other funding scheme   | 28.9                                     | 44.7  | 18.4  | 2.6  | 5.3        | 38         |
| <b>Total</b>   | <b>29.9</b>                              | <b>48.6</b>                                       | <b>14.8</b>                                       | <b>2.5</b>   | <b>4.2</b> | <b>284</b> |
| <b>f) Create new international research networks</b>   |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 37.3                                     | 37.3  | 16.4  | 4.5  | 4.5        | 67         |
| Large-scale programme  | 31.8                                     | 54.5  | 10.6  | 1.5  | 1.5        | 66         |
| Centre Scheme (SFF/SFI/FME)  | 31.3                                     | 43.8  | 12.5  | 12.5   | 0.0        | 16         |
| User-directed programme  | 31.7                                     | 48.8  | 12.2  | 2.4  | 4.9        | 41         |
| Policy-oriented programme  | 42.4                                     | 40.7  | 10.2  | 3.4  | 3.4        | 59         |
| Other funding scheme   | 52.5                                     | 32.5  | 7.5   | 2.5  | 5.0        | 40         |
| <b>Total</b>   | <b>38.1</b>                              | <b>43.3</b>                                       | <b>11.8</b>                                       | <b>3.5</b>   | <b>3.5</b> | <b>289</b> |
| <b>i) Create or strengthen collaboration with industry</b>   |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 3.1                                      | 20.0  | 55.4  | 10.8   | 10.8       | 65         |
| Large-scale programme  | 18.8                                     | 28.1  | 42.2  | 9.4  | 1.6        | 64         |
| Centre Scheme (SFF/SFI/FME)  | 46.7                                     | 33.3  | 13.3  | 6.7  | 0.0        | 15         |
| User-directed programme  | 61.0                                     | 22.0  | 12.2  | 0.0  | 4.9        | 41         |
| Policy-oriented programme  | 16.1                                     | 21.4  | 39.3  | 10.7   | 12.5       | 56         |
| Other funding scheme   | 21.1                                     | 21.1  | 42.1  | 5.3  | 10.5       | 38         |
| <b>Total</b>   | <b>22.6</b>                              | <b>23.3</b>                                       | <b>38.7</b>                                       | <b>7.9</b>   | <b>7.5</b> | <b>279</b> |
| <b>o) Prepare for participation in international funding programmes</b>  |  |   |   |  |            |            |
| FRIPRO/Basic research programme  | 18.5                                     | 32.3  | 36.9  | 4.6  | 7.7        | 65         |
| Large-scale programme  | 18.8                                     | 46.9  | 28.1  | 3.1  | 3.1        | 64         |
| Centre Scheme (SFF/SFI/FME)  | 6.3                                      | 68.8  | 12.5  | 12.5   | 0.0        | 16         |
| User-directed programme  | 19.5                                     | 58.5  | 14.6  | 2.4  | 4.9        | 41         |
| Policy-oriented programme  | 18.2                                     | 41.8  | 30.9  | 3.6  | 5.5        | 55         |
| Other funding scheme   | 17.9                                     | 38.5  | 35.9  | 0.0  | 7.7        | 39         |
| <b>Total</b>   | <b>17.9</b>                              | <b>44.3</b>                                       | <b>28.9</b>                                       | <b>3.6</b>   | <b>5.4</b> | <b>280</b> |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012.

\*The figures include replies from researchers who have received funding from the respective type of funding scheme. Each respondent is included under the funding scheme of their most recent RCN grant in the period 2003-2011. The category 'Other funding schemes' includes 6 respondents who replied 'Networking measures'. The remaining in this category replied 'Other funding' (than the listed categories).

**Table A 4 Clarity and easy to understand information about the call by field of research. Percentages.**

| Field of research       | 5<br>To a great extent | 4           | 3           | 2          | 1<br>Not at all | Cannot say/NA | N          | *Mean score |
|-------------------------|------------------------|-------------|-------------|------------|-----------------|---------------|------------|-------------|
| Humanities              | 12.5                   | 34.7        | 18.1        | 15.3       | 2.8             | 16.7          | 72         | 3.5         |
| Natural sciences        | 21.4                   | 34.5        | 23.4        | 11.7       | 1.4             | 7.6           | 145        | 3.7         |
| Medical sciences        | 12.2                   | 41.5        | 15.9        | 11.0       | 1.2             | 18.3          | 82         | 3.6         |
| Social sciences         | 17.1                   | 32.9        | 30.7        | 5.0        | 1.4             | 12.9          | 140        | 3.7         |
| Engineering sciences    | 22.5                   | 36.0        | 20.2        | 11.2       | 1.1             | 9.0           | 89         | 3.7         |
| Agriculture and fishery | 14.8                   | 40.7        | 29.6        | 11.1       | 1.9             | 1.9           | 54         | 3.6         |
| Multiple areas, other   | 5.6                    | 38.9        | 38.9        | 2.8        | 0.0             | 13.9          | 36         | 3.6         |
| <b>Total</b>            | <b>16.8</b>            | <b>36.1</b> | <b>24.4</b> | <b>9.9</b> | <b>1.5</b>      | <b>11.3</b>   | <b>618</b> | <b>3.6</b>  |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012. Question: Considering your experiences the last 3 years, to what extent were the following characteristics of the Research Council of Norway's (RCN) funding processes satisfactory? Clarity and easy to understand information about the call.

\*Average of replies on the scale from 1 to 5, not including the 'cannot say' replies.

**Table A 5 Clarity and easy to understand information about the call by type of RCN funding scheme. Percentages and mean.**

| **Type of funding scheme        | 5<br>To a great extent | 4           | 3           | 2          | 1<br>Not at all | Cannot say/NA | N          | *Mean score |
|---------------------------------|------------------------|-------------|-------------|------------|-----------------|---------------|------------|-------------|
| FRIPRO/Basic research programme | 25.4                   | 34.9        | 23.8        | 9.5        | 1.6             | 4.8           | 63         | 3.8         |
| Large-scale programme           | 19.4                   | 44.8        | 23.9        | 10.4       | 0.0             | 1.5           | 67         | 3.7         |
| Centre Scheme (SFF/SFI/FME)     | 25.0                   | 31.3        | 43.8        | 0.0        | 0.0             | 0.0           | 16         | 3.8         |
| User-directed programme         | 22.0                   | 43.9        | 24.4        | 9.8        | 0.0             | 0.0           | 41         | 3.8         |
| Policy-oriented programme       | 22.8                   | 38.6        | 24.6        | 10.5       | 0.0             | 3.5           | 57         | 3.8         |
| Other funding scheme            | 30.0                   | 32.5        | 25.0        | 5.0        | 0.0             | 7.5           | 40         | 4.0         |
| <b>Total</b>                    | <b>23.6</b>            | <b>38.7</b> | <b>25.4</b> | <b>8.8</b> | <b>0.4</b>      | <b>3.2</b>    | <b>284</b> | <b>3.8</b>  |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012. Question: Considering your experiences the last 3 years, to what extent were the following characteristics of the Research Council of Norway's (RCN) funding processes satisfactory? Clarity and easy to understand information about the call.

\*Average of replies on the scale from 1 to 5, not including the 'cannot say' replies.

\*\* The figures include replies from researchers who have received funding from the respective type of funding scheme. Each respondent is included under the funding scheme of their most recent RCN grant in the period 2003-2011. The category 'Other funding schemes' includes 6 respondents who replied 'Networking measures'. The remaining in this category replied 'Other funding' (than the listed categories).

**Table A 6 Clarity of the distinction between RCN application types by field of research. Percentages and mean.**

| Field of research       | 5<br>To a great extent | 4           | 3           | 2          | 1<br>Not at all | Cannot say/NA | N          | *Mean score |
|-------------------------|------------------------|-------------|-------------|------------|-----------------|---------------|------------|-------------|
| Humanities              | 7.1                    | 25.7        | 30.0        | 11.4       | 1.4             | 24.3          | 70         | 3.3         |
| Natural sciences        | 19.4                   | 29.2        | 31.9        | 7.6        | 1.4             | 10.4          | 144        | 3.6         |
| Medical sciences        | 9.9                    | 30.9        | 23.5        | 12.3       | 2.5             | 21.0          | 81         | 3.4         |
| Social sciences         | 18.6                   | 22.9        | 30.0        | 7.9        | 2.9             | 17.9          | 140        | 3.6         |
| Engineering sciences    | 17.0                   | 42.0        | 21.6        | 8.0        | 2.3             | 9.1           | 88         | 3.7         |
| Agriculture and fishery | 18.9                   | 41.5        | 24.5        | 9.4        | 1.9             | 3.8           | 53         | 3.7         |
| Multiple areas, other   | 5.6                    | 30.6        | 38.9        | 11.1       | 0.0             | 13.9          | 36         | 3.4         |
| <b>Total</b>            | <b>15.4</b>            | <b>30.6</b> | <b>28.4</b> | <b>9.2</b> | <b>2.0</b>      | <b>14.5</b>   | <b>612</b> | <b>3.6</b>  |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012. Question: Considering your experiences the last 3 years, to what extent were the following characteristics of the Research Council of Norway's (RCN) funding processes satisfactory? Clarity of the distinction between application types.

\*Average of replies on the scale from 1 to 5, not including the 'cannot say' replies. The category 'Other funding schemes' includes 6 respondents who replied 'Networking measures'. The remaining in this category replied 'Other funding' (than the listed categories).

**Table A 7 Clarity of the distinction between RCN application types by type of RCN funding scheme. Percentages and mean.**

| **Type of funding scheme               | 5<br>To a great extent | 4           | 3           | 2          | 1<br>Not at all | Cannot say/NA | N          | *Mean score |
|--|------------------------|-------------|-------------|------------|-----------------|---------------|------------|-------------|
| <b>FRIPRO/Basic research programme</b> | 14.3                   | 44.4        | 22.2        | 6.3        | 3.2             | 9.5           | 63         | 3.7         |
| <b>Large-scale programme</b>           | 25.4                   | 32.8        | 32.8        | 9.0        | 0.0             | 0.0           | 67         | 3.8         |
| <b>Centre Scheme (SFF/SFI/FME)</b>     | 43.8                   | 6.3         | 31.3        | 6.3        | 0.0             | 12.5          | 16         | 4.0         |
| <b>User-directed programme</b>         | 30.0                   | 37.5        | 20.0        | 12.5       | 0.0             | 0.0           | 40         | 3.9         |
| <b>Policy-oriented programme</b>       | 19.6                   | 39.3        | 25.0        | 8.9        | 0.0             | 7.1           | 56         | 3.8         |
| <b>Other funding scheme</b>            | 17.5                   | 20.0        | 40.0        | 10.0       | 2.5             | 10.0          | 40         | 3.4         |
| <b>Total</b>                           | <b>22.3</b>            | <b>34.0</b> | <b>28.0</b> | <b>8.9</b> | <b>1.1</b>      | <b>5.7</b>    | <b>282</b> | <b>3.7</b>  |

Source: NIFU survey for the evaluation of RCN 2012 – survey of Norwegian researchers. For sample and response rate see Langfeldt et al 2012. Question: Considering your experiences the last 3 years, to what extent were the following characteristics of the Research Council of Norway's (RCN) funding processes satisfactory? Clarity of the distinction between application types.  
\*Average of replies on the scale from 1 to 5, not including the 'cannot say' replies.

\*\* The figures include replies from researchers who have received funding from the respective type of funding scheme. Each respondent is included under the funding scheme of their most recent RCN grant in the period 2003-2011.

**Table A 8 'I think this is an important criterion when assessing FP/KPN/IPN projects'. Average score by field of expertise, 5 = To a high degree, 1 = Not at all.**

| Field of research/<br>expertise                           | Natural sciences |     | Engineering and technology |    | Medical sciences |    | Humanities |    | Social sciences |    | Other/<br>no reply |    | Total |     |
|---|------------------|-----|----------------------------|----|------------------|----|------------|----|-----------------|----|--------------------|----|-------|-----|
|   | Mean             | N   | Mean                       | N  | Mean             | N  | Mean       | N  | Mean            | N  | Mean               | N  | Mean  | N   |
| <b>Researcher projects</b>                                |                  |     |                            |    |                  |    |            |    |                 |    |                    |    |       |     |
| 2a) Scientific merit                                      | 5.0              | 129 | 4.9                        | 98 | 5.0              | 40 | 4.9        | 20 | 4.9             | 85 | 5.0                | 24 | 4.9   | 396 |
| 2b) Project management and the Project group              | 4.2              | 128 | 4.3                        | 98 | 4.6              | 40 | 4.3        | 20 | 4.4             | 85 | 4.4                | 24 | 4.3   | 395 |
| 2c) Implementation plan and resource parameters           | 4.2              | 127 | 4.2                        | 97 | 4.2              | 40 | 4.1        | 20 | 4.3             | 85 | 4.1                | 23 | 4.2   | 392 |
| 2d) National cooperation                                  | 3.2              | 128 | 3.3                        | 96 | 3.2              | 40 | 3.3        | 20 | 3.4             | 85 | 3.5                | 24 | 3.3   | 393 |
| 2e) International cooperation                             | 3.7              | 128 | 3.7                        | 98 | 3.8              | 40 | 4.2        | 20 | 3.8             | 85 | 3.9                | 23 | 3.8   | 394 |
| 2f) Dissemination and communication of results            | 3.5              | 127 | 3.6                        | 98 | 3.4              | 40 | 4.0        | 20 | 4.1             | 85 | 3.8                | 25 | 3.7   | 395 |
| 2g) Relevance relative to the call for proposals          | 4.2              | 126 | 4.2                        | 95 | 4.1              | 40 | 4.3        | 19 | 4.5             | 84 | 4.5                | 24 | 4.3   | 388 |
| <b>KPN</b>  |                  |     |                            |    |                  |    |            |    |                 |    |                    |    |       |     |
| 6a) Level of research                                     | 4.6              | 28  | 4.6                        | 78 | -                | 2  | -          | 1  | 4.5             | 13 | 4.6                | 16 | 4.6   | 138 |
| 6b) Scientific merit                                      | 4.6              | 28  | 4.5                        | 78 | -                | 2  | -          | 1  | 4.3             | 14 | 4.4                | 16 | 4.5   | 139 |
| 6c) The project manager and project group                 | 4.1              | 28  | 4.3                        | 77 | -                | 2  | -          | 1  | 4.0             | 14 | 4.4                | 16 | 4.2   | 138 |
| 6d) Implementation plan and resource parameters           | 4.3              | 28  | 4.4                        | 76 | -                | 2  | -          | 1  | 4.1             | 14 | 4.6                | 16 | 4.4   | 137 |
| <b>IPN</b>  |                  |     |                            |    |                  |    |            |    |                 |    |                    |    |       |     |
| 10a) Level of innovation                                  | 4.5              | 11  | 4.4                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 4.4   | 52  |
| 10b) Potential for value creation for industrial partners | 4.4              | 11  | 4.3                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 4.3   | 52  |
| 10c) Realisation of the innovation                        | 4.6              | 11  | 4.3                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 4.4   | 52  |
| 10d) Level of research                                    | 4.1              | 11  | 3.6                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 3.7   | 52  |
| 10e) R&D project quality                                  | 4.5              | 11  | 4.2                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 4.2   | 52  |
| 10f) Implementation capacity                              | 4.4              | 11  | 4.3                        | 36 |                  |    |            |    | -               | 2  | -                  | 3  | 4.2   | 52  |

Source: NIFU survey of RCN reviewers 2016. Averages are not calculated for categories below 10 cases.

**Table A 9 RCN reviewers' sector of employment. By type of grant reviewed. Per cent.**

| Sector of employment                    | Researcher projects | Knowledge-building Projects for Industry (KPN) | Innovation Projects for the Industrial Sector (IPN) |
|---|---------------------|--|---|
| University/Higher education institution | 82.5                | 66.9   | 26.4  |
| Independent research institute          | 10.0                | 16.9   | 13.2  |
| Public administration                   | 2.8                 | 4.2  | 7.5   |
| Industry/Private enterprise             | 2.5                 | 7.0  | 45.3  |
| Other (including NGOs)                  | 1.5                 | 3.5  | 5.7   |
| No reply                                | 0.8                 | 1.4  | 1.9   |
| N                                       | 400                 | 142  | 53  |

Source: NIFU survey of RCN reviewers 2016.

**Table A 10 RCN reviewers' country of residence. By type of grant reviewed. Per cent.**

| Country of residence  | Researcher projects | Knowledge-building Projects for Industry (KPN) | Innovation Projects for the Industrial Sector (IPN) |
|---|---------------------|--|---|
| Europe, apart from the Nordic countries                               | 65.3                | 54.9   | 1.9   |
| Nordic country, apart from Norway (Denmark, Finland, Iceland, Sweden) | 30.5                | 25.4   | 13.2  |
| Outside Europe  | 2.0                 | 16.9   | 0.0   |
| Norway  | 1.5                 | 1.4  | 83.0  |
| No reply  | 0.8                 | 1.4  | 1.9   |
| N   | 400                 | 142  | 53  |

Source: NIFU survey of RCN reviewers 2016.

**Table A 11 'I think the RCN guidelines for this criterion are clear/easy to understand'.  
Average score by field of expertise, 5 = To a high degree, 1 = Not at all.**

| Field of research/<br>expertise                                 | Natural<br>sciences |     | Engineering<br>and<br>technology |    | Medical<br>sciences |    | Humanities |    | Social<br>sciences |    | Other/<br>no reply |    | Total |     |
|---|---------------------|-----|----------------------------------|----|---------------------|----|------------|----|--------------------|----|--------------------|----|-------|-----|
|   | Mean                | N   | Mean                             | N  | Mean                | N  | Mean       | N  | Mean               | N  | Mean               | N  | Mean  | N   |
| <b>Researcher projects</b>                                      |                     |     |                                  |    |                     |    |            |    |                    |    |                    |    |       |     |
| 3a) Scientific merit  | 4.7                 | 125 | 4.4                              | 89 | 4.6                 | 39 | 4.5        | 20 | 4.6                | 79 | 4.4                | 23 | 4.6   | 375 |
| 3b) Project management<br>and the Project group                 | 4.4                 | 122 | 4.2                              | 89 | 4.4                 | 38 | 4.1        | 20 | 4.4                | 78 | 4.2                | 23 | 4.3   | 370 |
| 3c) Implementation plan and<br>resource parameters              | 4.2                 | 122 | 4.0                              | 89 | 4.1                 | 37 | 3.8        | 20 | 4.1                | 76 | 4.0                | 22 | 4.1   | 366 |
| 3d) National cooperation  | 4.0                 | 121 | 3.9                              | 87 | 4.1                 | 37 | 4.2        | 20 | 3.9                | 76 | 4.0                | 23 | 4.0   | 364 |
| 3e) International<br>cooperation                                | 4.1                 | 123 | 4.1                              | 89 | 4.3                 | 37 | 4.4        | 20 | 4.0                | 77 | 4.0                | 22 | 4.1   | 368 |
| 3f) Dissemination and<br>communication of results               | 3.9                 | 123 | 3.9                              | 88 | 4.2                 | 38 | 4.0        | 20 | 3.9                | 75 | 3.9                | 22 | 3.9   | 366 |
| 3g) Relevance relative to<br>the call for proposals             | 4.1                 | 122 | 4.1                              | 86 | 3.9                 | 39 | 3.8        | 19 | 4.1                | 74 | 4.1                | 23 | 4.1   | 363 |
| <b>KPN</b>  |                     |     |                                  |    |                     |    |            |    |                    |    |                    |    |       |     |
| 7a) Level of research   | 4.3                 | 26  | 4.2                              | 73 | -                   | 1  | -          | 1  | 3.8                | 14 | 4.4                | 15 | 4.2   | 130 |
| 7b) Scientific merit  | 4.5                 | 26  | 4.1                              | 72 | -                   | 1  | -          | 1  | 4.1                | 14 | 4.3                | 15 | 4.2   | 129 |
| 7c) The project manager<br>and project group                    | 4.5                 | 26  | 4.2                              | 72 | -                   | 1  | -          | 1  | 4.1                | 14 | 4.1                | 15 | 4.2   | 129 |
| 7d) Implementation plan<br>and resource parameters              | 4.2                 | 26  | 4.2                              | 72 | -                   | 1  | -          | 1  | 4.2                | 14 | 4.1                | 15 | 4.2   | 129 |
| <b>IPN</b>  |                     |     |                                  |    |                     |    |            |    |                    |    |                    |    |       |     |
| 11a) Level of innovation  | -                   | 9   | 4.1                              | 36 |                     |    |            |    | -                  | 2  | -                  | 3  | 4.0   | 50  |
| 11b) Potential for value<br>creation for industrial<br>partners | 4.0                 | 10  | 3.9                              | 36 |                     |    |            |    | -                  | 1  | -                  | 3  | 3.9   | 50  |
| 11c) Realisation of the<br>innovation                           | 4.1                 | 10  | 3.9                              | 36 |                     |    |            |    | -                  | 2  | -                  | 3  | 3.9   | 51  |
| 11d) Level of research  | 3.9                 | 10  | 3.8                              | 36 |                     |    |            |    | -                  | 2  | -                  | 3  | 3.8   | 51  |
| 11e) R&D project quality  | 4.1                 | 10  | 3.9                              | 36 |                     |    |            |    | -                  | 2  | -                  | 3  | 3.9   | 51  |
| 11f) Implementation<br>capacity                                 | 3.8                 | 10  | 4.0                              | 36 |                     |    |            |    | -                  | 2  | -                  | 3  | 3.9   | 51  |

Source: NIFU survey of RCN reviewers 2016. Averages are not calculated for categories below 10 cases.

**Table A 12 Researcher projects. 'I think the RCN guidelines for this criterion are clear/easy to understand'. Per cent of respondents' scores by their number of reviewed proposals 2015.**

| Researcher project criteria                     | Rate on clarity            | Reviewed min<br>3 FP 2015 |      | Total | Rate difference<br>(percentage<br>points) |
|---|----------------------------|---------------------------|------|-------|---|
|   |                            | No                        | Yes  |       |   |
| a) Scientific merit                             | 5 To a high degree         | 27.3                      | 61.4 | 59.5  | 34.1                                      |
|   | 4                          | 50.0                      | 29.0 | 30.1  | -21.0                                     |
|   | 3                          | 18.2                      | 3.8  | 4.6   | -14.4                                     |
|   | 2                          | 0.0                       | 0.8  | 0.8   | 0.8                                       |
|   | Cannot remember/Cannot say | 4.5                       | 5.1  | 5.1   | 0.6                                       |
|   | N                          | 22                        | 373  | 395   |   |
| b) Project management and the Project group     | 5 To a high degree         | 18.2                      | 45.8 | 44.3  | 27.6                                      |
|   | 4                          | 54.5                      | 35.3 | 36.4  | -19.2                                     |
|   | 3                          | 22.7                      | 11.3 | 12.0  | -11.4                                     |
|   | 2                          | 0.0                       | 1.3  | 1.3   | 1.3                                       |
|   | 1 Not at all               | 0.0                       | 0.3  | 0.3   | 0.3                                       |
|   | Cannot remember/Cannot say | 4.5                       | 5.9  | 5.9   | 1.4                                       |
| N   | 22                         | 371                       | 393  |       |   |
| c) Implementation plan and resource parameters  | 5 To a high degree         | 22.7                      | 37.7 | 36.9  | 15.0                                      |
|   | 4                          | 45.5                      | 33.7 | 34.4  | -11.8                                     |
|   | 3                          | 27.3                      | 17.0 | 17.6  | -10.3                                     |
|   | 2                          | 0.0                       | 3.8  | 3.6   | 3.8                                       |
|   | 1 Not at all               | 0.0                       | 0.8  | 0.8   | 0.8                                       |
|   | Cannot remember/Cannot say | 4.5                       | 7.0  | 6.9   | 2.5                                       |
| N   | 22                         | 371                       | 393  |       |   |
| d) National cooperation                         | 5 To a high degree         | 13.6                      | 37.8 | 36.5  | 24.2                                      |
|   | 4                          | 40.9                      | 29.7 | 30.4  | -11.2                                     |
|   | 3                          | 27.3                      | 17.3 | 17.9  | -10.0                                     |
|   | 2                          | 4.5                       | 6.2  | 6.1   | 1.7                                       |
|   | 1 Not at all               | 0.0                       | 2.2  | 2.0   | 2.2                                       |
|   | Cannot remember/Cannot say | 13.6                      | 6.8  | 7.1   | -6.8                                      |
| N   | 22                         | 370                       | 392  |       |   |
| e) International cooperation                    | 5 To a high degree         | 18.2                      | 39.2 | 38.1  | 21.0                                      |
|   | 4                          | 54.5                      | 33.9 | 35.0  | -20.6                                     |
|   | 3                          | 22.7                      | 14.2 | 14.7  | -8.5                                      |
|   | 2                          | 0.0                       | 4.8  | 4.6   | 4.8                                       |
|   | 1 Not at all               | 0.0                       | 1.1  | 1.0   | 1.1                                       |
|   | Cannot remember/Cannot say | 4.5                       | 6.7  | 6.6   | 2.2                                       |
| N   | 22                         | 372                       | 394  |       |   |
| f) Dissemination and communication of results   | 5 To a high degree         | 18.2                      | 33.5 | 32.7  | 15.3                                      |
|   | 4                          | 59.1                      | 30.8 | 32.4  | -28.3                                     |
|   | 3                          | 18.2                      | 20.5 | 20.4  | 2.3                                       |
|   | 2                          | 0.0                       | 5.9  | 5.6   | 5.9                                       |
|   | 1 Not at all               | 0.0                       | 2.4  | 2.3   | 2.4                                       |
|   | Cannot remember/Cannot say | 4.5                       | 6.8  | 6.6   | 2.3                                       |
| N   | 22                         | 370                       | 392  |       |   |
| g) Relevance relative to the call for proposals | 5 To a high degree         | 13.6                      | 39.6 | 38.2  | 26.0                                      |
|   | 4                          | 54.5                      | 29.1 | 30.5  | -25.4                                     |
|   | 3                          | 22.7                      | 17.5 | 17.8  | -5.2                                      |
|   | 2                          | 4.5                       | 4.0  | 4.1   | -0.5                                      |
|   | 1 Not at all               | 0.0                       | 1.9  | 1.8   | 1.9                                       |
|   | Cannot remember/Cannot say | 4.5                       | 7.8  | 7.6   | 3.3                                       |
| N   | 22                         | 371                       | 393  |       |   |

Source: NIFU survey of RCN reviewers 2016.



**Table A 13 KPN. 'I think the RCN guidelines for this criterion are clear/easy to understand'.  
Per cent of respondents' scores by their number of reviewed proposals 2015.**

| KPN  | Rate on clarity            | Reviewed min<br>3 KPN 2015 |      | Total | Rate difference<br>(percentage<br>points) |
|--|----------------------------|----------------------------|------|-------|---|
|  |                            | No                         | Yes  |       |   |
| a) Level of research                           | 5 To a high degree         | 37.9                       | 30.6 | 36.0  | -7.3                                      |
|  | 4                          | 42.7                       | 38.9 | 41.7  | -3.8                                      |
|  | 3                          | 9.7                        | 22.2 | 12.9  | 12.5                                      |
|  | 2                          | 1.0                        | 5.6  | 2.2   | 4.6                                       |
|  | 1 Not at all               | 1.0                        | 0.0  | 0.7   | -1.0                                      |
|  | Cannot remember/Cannot say | 7.8                        | 2.8  | 6.5   | -5.0                                      |
|  | N                          | 103                        | 36   | 139   |   |
| b) Scientific merit                            | 5 To a high degree         | 37.9                       | 34.3 | 37.0  | -3.6                                      |
|  | 4                          | 45.6                       | 31.4 | 42.0  | -14.2                                     |
|  | 3                          | 7.8                        | 25.7 | 12.3  | 17.9                                      |
|  | 2                          | 1.0                        | 5.7  | 2.2   | 4.7                                       |
|  | Cannot remember/Cannot say | 7.8                        | 2.9  | 6.5   | -4.9                                      |
|  | N                          | 103                        | 35   | 138   |   |
| c) The project manager and project group       | 5 To a high degree         | 35.9                       | 40.0 | 37.0  | 4.1                                       |
|  | 4                          | 43.7                       | 48.6 | 44.9  | 4.9                                       |
|  | 3                          | 10.7                       | 5.7  | 9.4   | -5.0                                      |
|  | 2                          | 1.9                        | 2.9  | 2.2   | 1.0                                       |
|  | Cannot remember/Cannot say | 7.8                        | 2.9  | 6.5   | -4.9                                      |
|  | N                          | 103                        | 35   | 138   |   |
| d) Implementation plan and resource parameters | 5 To a high degree         | 35.9                       | 28.6 | 34.1  | -7.3                                      |
|  | 4                          | 40.8                       | 60.0 | 45.7  | 19.2                                      |
|  | 3                          | 12.6                       | 5.7  | 10.9  | -6.9                                      |
|  | 2                          | 2.9                        | 2.9  | 2.9   | 0.0                                       |
|  | Cannot remember/Cannot say | 7.8                        | 2.9  | 6.5   | -4.9                                      |
|  | N                          | 103                        | 35   | 138   |   |

Source: NIFU survey of RCN reviewers 2016.

**Table A 14 IPN. 'I think the RCN guidelines for this criterion are clear/easy to understand'.  
Per cent of respondents' scores by their number of reviewed proposals 2015.**

| IPN criteria  | Rate on clarity            | Reviewed min<br>3 IPN 2015 |      | Total | Rate difference<br>(percentage<br>points) |
|---|----------------------------|----------------------------|------|-------|---|
|   |                            | No                         | Yes  |       |   |
| a) Level of innovation                                  | 5 To a high degree         | 23.8                       | 29.0 | 26.9  | 5.2                                       |
|   | 4                          | 47.6                       | 48.4 | 48.1  | 0.8                                       |
|   | 3                          | 14.3                       | 19.4 | 17.3  | 5.1                                       |
|   | 2                          | 4.8                        | 0.0  | 1.9   | -4.8                                      |
|   | 1 Not at all               | 0.0                        | 3.2  | 1.9   | 3.2                                       |
|   | Cannot remember/Cannot say | 9.5                        | 0.0  | 3.8   | -9.5                                      |
|   | N                          | 21                         | 31   | 52    |   |
| b) Potential for value creation for industrial partners | 5 To a high degree         | 23.8                       | 19.4 | 21.2  | -4.4                                      |
|   | 4                          | 42.9                       | 51.6 | 48.1  | 8.7                                       |
|   | 3                          | 14.3                       | 22.6 | 19.2  | 8.3                                       |
|   | 2                          | 9.5                        | 6.5  | 7.7   | -3.0                                      |
|   | Cannot remember/Cannot say | 9.5                        | 0.0  | 3.8   | -9.5                                      |
|   | N                          | 21                         | 31   | 52    |   |
| c) Realisation of the innovation                        | 5 To a high degree         | 14.3                       | 16.1 | 15.4  | 1.8                                       |
|   | 4                          | 61.9                       | 58.1 | 59.6  | -3.8                                      |
|   | 3                          | 14.3                       | 22.6 | 19.2  | 8.3                                       |
|   | 2                          | 4.8                        | 3.2  | 3.8   | -1.6                                      |
|   | Cannot remember/Cannot say | 4.8                        | 0.0  | 1.9   | -4.8                                      |
|   | N                          | 21                         | 31   | 52    |   |
| d) Level of research                                    | 5 To a high degree         | 19.0                       | 16.1 | 17.3  | -2.9                                      |
|   | 4                          | 47.6                       | 45.2 | 46.2  | -2.4                                      |
|   | 3                          | 19.0                       | 35.5 | 28.8  | 16.5                                      |
|   | 2                          | 9.5                        | 3.2  | 5.8   | -6.3                                      |
|   | Cannot remember/Cannot say | 4.8                        | 0.0  | 1.9   | -4.8                                      |
|   | N                          | 21                         | 31   | 52    |   |
| e) R&D project quality                                  | 5 To a high degree         | 14.3                       | 16.1 | 15.4  | 1.8                                       |
|   | 4                          | 66.7                       | 54.8 | 59.6  | -11.9                                     |
|   | 3                          | 4.8                        | 25.8 | 17.3  | 21.0                                      |
|   | 2                          | 9.5                        | 3.2  | 5.8   | -6.3                                      |
|   | Cannot remember/Cannot say | 4.8                        | 0.0  | 1.9   | -4.8                                      |
|   | N                          | 21                         | 31   | 52    |   |
| f) Implementation capacity                              | 5 To a high degree         | 19.0                       | 22.6 | 21.2  | 3.6                                       |
|   | 4                          | 42.9                       | 61.3 | 53.8  | 18.4                                      |
|   | 3                          | 28.6                       | 12.9 | 19.2  | -15.7                                     |
|   | 2                          | 4.8                        | 3.2  | 3.8   | -1.6                                      |
|   | Cannot remember/Cannot say | 4.8                        | 0.0  | 1.9   | -4.8                                      |
|   | N                          | 21                         | 31   | 52    |   |

Source: NIFU survey of RCN reviewers 2016.

## Appendix 2 Overview of RCN grant types and criteria

**Table A 15** Number of RCN review criteria by grant type.

| Type of grant ('Application type')              | Number of review criteria*         |
|---|------------------------------------|
| 1. Researcher Project                           | 7                                  |
| 2. Young Research Talents                       | 9                                  |
| 3. Innovation Project for the Industrial Sector | 14                                 |
| 4. Innovation Project for the Public Sector     | 14                                 |
| 5. Knowledge-building Project for Industry      | 13                                 |
| 6. Project Establishment Support                | Criteria vary by call              |
| 7. Pre-project                                  | Criteria vary by call              |
| 8. Research Institution-based Strategic Project | 11                                 |
| 9. Research infrastructure                      | 17                                 |
| 10. Personal Doctoral Research Fellowship       | 7                                  |
| 11. Personal Post-doctoral Research Fellowship  | 7                                  |
| 12. Personal Visiting Researcher Grant          | 4                                  |
| 13. Personal Overseas Research Grant            | 4                                  |
| 14. Personal Mobility Grant                     | 2                                  |
| 15. Support for Events                          | 4                                  |
| 16. Project outline                             | Not relevant/no defined criteria** |
| 17. Other Support                               | Criteria vary by call              |

\*Including both criteria for external/panel review and aspects assessed by RCN staff/the programme board. Not including the general check points/selection criteria across grant types (see Table 3.3). Not including 'Overall assessment of the referee/panel' when this is rated separately.

\*\* No defined criteria, the purpose is to establish a dialogue between the Research Council and the applicant in advance of the issuing of a call for proposals.

**Table A 16 RCN review criteria as applied across grant types (m=main criterion; s=selection criterion).**

| Criterion   | Researcher project | Young talents | IPN | IPO | KPN | ISP | Infrastructures | PhD | Postdoc | Guest grant | Overseas grant | Mobility grant | Event | Type*       |
|---|--------------------|---------------|-----|-----|-----|-----|-----------------|-----|---------|-------------|----------------|----------------|-------|-------------|
| Scientific merit  | m                  | m             |     |     | m   | m   |                 | m   | m       |             |                |                |       | 1,3,4,2a,5  |
| Level of research   |                    |               | m   | m   | m   |     |                 |     |         |             |                |                |       | 2a, 1       |
| Benefit to research of the infrastructure                 |                    |               |     |     |     |     | m               |     |         |             |                |                |       | 2a, B       |
| The national importance of the infrastructure             |                    |               |     |     |     |     | m               |     |         |             |                |                |       | 2 (a,b)     |
| Benefits for the national knowledge base                  |                    |               |     |     | s   | s   |                 |     |         |             |                |                |       | 2 (a,b)     |
| Relevance of the research for innovation                  |                    |               | m   | m   |     |     |                 |     |         |             |                |                |       | 2b          |
| Level of innovation                                       |                    |               | m   | m   |     |     |                 |     |         |             |                |                |       | 2b          |
| Relevance and benefit to trade and industry               |                    |               |     |     | m   |     | m               |     |         |             |                |                |       | 2b          |
| Relevance and benefit to society                          |                    |               |     |     |     | s   | m               |     |         |             |                |                |       | 2b          |
| Potential for value creation for industrial partners      |                    |               | m   |     |     |     |                 |     |         |             |                |                |       | 2b          |
| Other socio-economic benefits                             |                    |               | s   | s   |     |     |                 |     |         |             |                |                |       | 2b          |
| Dissemination and communication of results                | m                  | m             | s   | s   | s   | s   |                 | m   | m       | s           | s              |                | s     | 2 (a,b)     |
| Relevance relative to the call for proposals              | s                  | s             | s   | s   | s   | s   | m               | s   | s       | s           | s              |                | s     | 2           |
| Potential for value creation within the public sector     |                    |               |     | m   |     |     |                 |     |         |             |                |                |       | 2b          |
| Boldness in thinking and scientific renewal               |                    | m             |     |     |     |     |                 |     |         |             |                |                |       | 3           |
| R&D-related risk  |                    |               | s   | s   |     |     |                 |     |         |             |                |                |       | 3           |
| Quality of the application documents                      |                    |               | m   | m   | m   |     | m               |     |         |             |                |                |       | 4           |
| Implementation plan and resource parameters               | m                  | m             |     |     | m/s | m   | m               | m   | m       | s           | s              |                |       | 5           |
| R&D project quality                                       |                    |               | m   | m   |     |     |                 |     |         |             |                |                |       | 5           |
| Realisation of the innovation                             |                    |               | m   | m   |     |     |                 |     |         |             |                |                |       | 5           |
| Realisation of the innovation in the public sector        |                    |               |     |     | m   |     |                 |     |         |             |                |                |       | 5           |
| Scientific and technological solutions                    |                    |               |     |     |     |     | m               |     |         |             |                |                |       | 5 (other**) |
| Administrative leadership and operation of infrastructure |                    |               |     |     |     |     | m               |     |         |             |                |                |       | 5, B, C     |
| Implementation capacity                                   |                    |               | m   | m   |     |     | m               |     |         |             |                |                |       | B, C, 5     |
| The project group   |                    | m             |     |     |     |     |                 |     |         |             |                |                |       | B, C, 5     |
| The project manager                                       |                    | m             |     |     |     |     |                 |     |         |             |                |                |       | B           |
| The project manager and project group                     | m                  |               |     |     | m   | m   |                 | m   | m       |             |                |                |       | B, C, 5     |
| Candidate for fellowships/grants                          |                    |               |     |     |     |     |                 |     |         | s           | s              | s              |       | B           |
| Scientific management of the infrastructure               |                    |               |     |     |     |     | m               |     |         |             |                |                |       | B, C, 5, 2b |
| User participation  |                    |               |     |     | m   |     |                 |     |         |             |                |                |       | C           |
| Strategic basis and importance                            |                    |               |     |     | s   | s   | m               |     |         |             |                |                |       | C           |
| International cooperation                                 | s                  | s             | s   | s   | s   | m   |                 | s   | s       |             |                |                | s     | C           |
| Internationalisation                                      | s                  | s             | s   | s   | s   | s   | s               | s   | s       | s           | s              | s              | s     | 6           |
| Ethical perspectives                                      | s                  | s             | s   | s   | s   | s   | s               | s   | s       | s           | s              | s              | s     | 6           |
| Gender balance in the project                             | s                  | s             | s   | s   | s   | s   |                 | s   | s       | s           | s              | s              | s     | 6           |
| Gender perspectives in the research                       | s                  | s             | s   | s   | s   | s   |                 | s   | s       | s           | s              | s              | s     | 6           |
| Environmental impact                                      | s                  | s             | s   | s   | s   | s   | s               | s   | s       | s           | s              | s              | s     | 6           |
| Recruitment of women                                      | s                  | s             | s   | s   | s   | s   |                 | s   | s       | s           | s              | s              | s     | 6           |
| Distribution of national research responsibility          |                    |               |     |     |     | s   | m               |     |         |             |                |                |       | 6           |
| National cooperation                                      | s                  | s             |     |     |     | s   | m               | s   | s       |             |                |                | s     | 6           |
| Additionality   |                    |               | m   | m   |     |     |                 |     |         |             |                |                |       | other       |

\*Type refers to aspects covered by the criterion (see criteria descriptions sorted by main aspect in next table). 1= scientific quality of the proposed research (scientific quality in general); 2=relevance/significance/expected impacts of the proposed research (both (a) scientific and (b) broader/societal/economic significance); 3=originality/ground-breaking character/risk-level of the proposed research; 4=clarity of the proposed research; 5= feasibility of the proposed research; B=competences of the applicants; C=commitment and resources of the research environment/partners; 6= compliance with general requirements/other aspects.

\*\* Also addresses investment costs.

**Table A 17 Description of RCN review criteria**

| Criterion  | Reviewer guide/text in review form:   |
|--|---|
| <b>1 Addressing the scientific quality of the proposed research/general criteria</b> |   |
| <b>Scientific merit</b>  | This criterion gives an indication of the essential, fundamental aspects of the research project. The scientific merit of a project will be assessed in relation to the following points: Originality in the form of scientific innovation and/or the development of new knowledge. Whether the research questions, hypotheses and objectives have been clearly and adequately specified. The strength of the theoretical approach, operationalisation and use of scientific methods. Documented knowledge about the research front. The degree to which the scientific basis of the project is realistic. The scientific scope in terms of a multi- and interdisciplinary approach, when relevant. |

| <b>2 Addressing relevance/significance/expected impacts of the proposed research</b> |   |
|--|---|
| <b>Level of research</b>   | This criterion gives an indication of the extent to which the project will produce new knowledge of significance for the scientific development of the fields covered by the research. It must be evident that the project incorporates knowledge about the research front. The level of research will be assessed in relation to the following points: Status of the project in relation to the international research front. The proportion of research in the R&D project.   |
| <b>Benefit to research of the infrastructure</b>                                     | This criterion gives an indication of the impact of the establishment of the infrastructure on research activities within the relevant subject areas, and the significance of the infrastructure for the national research community. The benefit to research of the infrastructure will be assessed in relation to the following points: This criterion gives an indication of the impact of the establishment of the infrastructure on research activities within the relevant subject areas, and the significance of the infrastructure for the national research community. The benefit to research of the infrastructure will be assessed in relation to the following points: Whether the research groups have documented expertise in the application areas as well as the level and scope of national research in the relevant area. Whether the research infrastructure will open up new opportunities for Norwegian research groups compared to existing infrastructure. The extent to which the research infrastructure contributes to scientific renewal, increases the scope of research activities, promotes the development of new knowledge, and drives research in areas of major national and/or international significance towards the research front. How the research infrastructure will be applied in relation to existing infrastructure. The potential to make Norwegian research groups attractive to the best researchers, nationally and internationally. The capacity to carry out high-priority research that Norwegian research groups could not otherwise conduct on their own. (This applies to projects that require international cooperation on research infrastructure.) |
| <b>The national importance of the infrastructure</b>                                 | This criterion gives an indication of the degree to which the infrastructure: Is of widespread national interest. Will be available in only one or a few locations in Norway (as a general rule). Will lay a foundation for internationally cutting-edge research. Will be made accessible to relevant researchers and industries. Will promote effective coordination between relevant research groups.  |
| <b>Benefits for the national knowledge base</b>                                      | This criterion gives an indication of the extent to which the project will contribute to long-term competence development in the Norwegian research community. The benefits for the national knowledge base will be assessed in relation to the following points: The role of the project in maintaining/strengthening the knowledge base. The development of cutting-edge expertise. Researcher training. The importance for relevant educational programmes and other forms of knowledge management. The national status of the R&D institution in relation to the thematic research areas.   |
| <b>Relevance of the research for innovation</b>                                      | This criterion gives an indication of the role of the R&D project in relation to the innovation sought. How important are the project's research results to the realisation of the innovation?  |
| <b>Level of innovation</b>   | This criterion gives an indication of the significance of the innovation in relation to the "state-of-the-art" in a field. In this context, the term "innovation" is to be understood as renewal or new creations that generate value added. The innovation will be assessed as to whether it represents an innovation solely for the partners or applies in a national/international context as well. Innovation areas: New or improved products/services. New or updated methods of production/delivery/distribution. New or updated structures for management/organisation/working conditions/competence. New or updated business models. [This is text for IPN, IPO text is a bit different.]   |
| <b>Relevance and benefit to trade and industry</b>                                   | This criterion gives an indication of the anticipated potential of the expertise/knowledge developed in connection with the project to generate value added in Norwegian trade and industry. The relevance and benefit to trade and industry will be assessed in relation to the following points: The need for this expertise among the participants from industry. The need for this expertise within Norwegian industry at large. The potential of the increased expertise to trigger new growth in Norwegian industry.  |
| <b>Relevance and benefit to society</b>  | This criterion gives an indication of how the project will contribute to knowledge/competence of significance to meeting societal challenges. In this context, the phrase "of significance" refers to how the knowledge/competence may be useful in meeting challenges in the public sector, industry or civil society viewed in a regional, national or global context.  |
| <b>Potential for value creation for industrial partners</b>                          | This criterion gives an indication of the anticipated financial gains for the industrial partners that will result from industrialisation and commercialisation activities related to the project. This potential will be compared against the aggregate expenses for the entire period (i.e. beyond the R&D project's duration and expenses per se). It should be assumed that the project will be successfully realised. The potential for value creation may encompass: New sales, Reduced costs, Upholding levels of competitiveness  |

|   |   |
|---|---|
| <b>Other socio-economic benefits</b>                          | This criterion gives an indication of the impact of a project on society outside of the utility value/commercial benefits for the partners in the target group. It should be assumed that the project will be successfully realised. External effects may encompass: Value creation in industry; Useful applications for the public sector; Useful applications for civil society; Dissemination of knowledge, diffusion of technology and knowledge-building within R&D institutions; Enhancement of the external environment.   |
| <b>Dissemination and communication of results</b>             | This criterion gives an indication of the quality of the dissemination and communication plans for the project. Dissemination and communication of results will be assessed in relation to the following points: Plans for scholarly publication, dissemination and other communication activities. Plans for popular science dissemination and communication activities vis-à-vis the general public as well as users of the project results, including planned use of channels and measures. Plans for ensuring that important users (in industry, community life and public administration) are incorporated into/take part in dissemination activities for the project. |
| <b>Relevance relative to the call for proposals</b>           | This criterion is used to assess the degree to which the project satisfies the guidelines and stipulations set out in the call for proposals.   |
| <b>Potential for value creation within the public sector</b>  | This criterion gives an indication of the anticipated value creation for the public sector and its users that will result from the realisation of the innovation. This value creation will be compared against the aggregate expenses for the R&D project and its realisation. The potential for value creation may encompass: Increased efficiency; Enhanced quality; Reduced costs; Increased benefit; Improved services; Improved tools/methods for decision-making; Other means of enhancing value creation.  |
| <b>3 Addressing originality/risk of the proposed research</b> |   |
| <b>Boldness in thinking and scientific renewal</b>            | This criterion gives an indication of how likely it is that the research project will lead to significant advances in theory, methodology or scientific knowledge, as opposed to more incremental progress. Relevant elements to be assessed in this context include: Bold hypotheses; High potential for significant theoretical advancement; Original methodology; Creative approach to expanding the current knowledge base in the field.  |
| <b>R&amp;D-related risk</b>                                   | This criterion gives an indication of the level of ambition established for the scientific objectives of the R&D project, and how scientifically challenging it will be to achieve these objectives in full. This criterion is to be assessed independently of both the project implementation plan and the implementation capacity of the parties to the application.<br>[high risk/ambition gives high rate]  |
| <b>4 Addressing the clarity of the proposed research</b>      |   |
| <b>Quality of the application documents</b>                   | This criterion gives an indication of the extent to which the application documents are satisfactory as a basis for assessing whether a project should be granted funding. The information and plans that have been requested must be clearly described.  |
| <b>5 Addressing the feasibility of the proposed research</b>  |   |
| <b>Implementation plan and resource parameters</b>            | This criterion gives an indication of whether the plan for project implementation is satisfactory, and whether the planned use of resources in the project is well-suited for the tasks in the project, based on assessment of the following elements: Plans for project implementation, including breakdown into work packages/sub-projects, milestones and deliverables. Need for personnel resources, as listed in terms of work time distributed by work packages, sub-projects or milestones. Need for other resources (such as equipment, data collection, field work), distributed by work packages/sub-projects or milestones.                                      |
| <b>R&amp;D project quality</b>                                | This criterion gives an indication of the extent to which the R&D project can be considered to be feasible. R&D project quality will be assessed in relation to the following points: R&D method; Project implementation plan, including milestones and deliverables; Budget and resource parameters, including financing   |
| <b>Realisation of the innovation</b>                          | This criterion gives an indication of the extent to which conditions are in place for realising the potential for value creation of the R&D project, assuming that it will be successful. The realisation of the innovation will be assessed in relation to the following points: The plan for realisation (business plan); Risk elements relating to industrialisation, commercialisation and implementation; Market risks; Organisational risks; Financing risks; Other risks.  |
| <b>Realisation of the innovation in the public sector</b>     | This criterion gives an indication of the extent to which conditions are in place for realising the potential for value creation of the R&D project, assuming that it will be successful. The realisation of the innovation will be assessed in relation to the following points: [1] The plan for realisation of the innovation: Plan of action; Milestones plan; Need for resources; Strategic basis. [2] Risk assessment and risk management: Implementation risk; Financing risks; Organisational risks; Risks relating to decision-making processes; Other risks.  |

|   |  |
|---|--|
| <b>Scientific and technological solutions</b>   | This criterion gives an indication of the adequacy of the choice of scientific and technological solutions, and will be assessed in relation to the following points: The feasibility of the project. The best available solutions; state-of-the-art. Total investment costs   |
| <b>Administrative leadership and operation of infrastructure</b>                      | This criterion gives an indication of the degree to which the plan for establishing and operating the infrastructure is considered satisfactory. Administrative leadership and operation of infrastructure will be assessed in relation to the following points: Plans relating to distribution of tasks and obligations regarding the operation, upgrading and life-cycle of the research infrastructure. The administrative contribution of any partners to enhancing the quality and feasibility of the project. The funding plan, including any co-funding from the institutions.  |
| <b>B Addressing the competences of the applicants</b>                                 |  |
| <b>Implementation capacity</b>  | This criterion gives an indication of the extent to which the partners, viewed as a whole, are seen as capable of performing the R&D project in an optimal fashion. The implementation capacity will be assessed in relation to the following points: Scientific management; Organisation and administrative leadership; Constellation of cooperating parties (make-up, roles and competence); The realisation of the innovation will not be assessed.   |
| <b>The project group</b>  | This criterion gives an indication of the qualifications of the project group and will be assessed in relation to the following points: Expertise and experience within the field of research. Extent of contact with national and international research environments. Experience with national and international collaboration on projects. The degree to which the project group is affiliated with research environments that have the competence and resources needed to ensure the success of the project.   |
| <b>The project manager</b>  | This criterion gives an indication of the qualifications of the project manager and will be assessed in relation to the following points: Expertise and experience within the field of research. Ability to develop research ideas. Demonstrated independence as a researcher, for instance through publications and mobility. Experience as project manager and supervisor. Extent of contact with national and international research environments. Experience with national and international collaboration on projects.  |
| <b>The project manager and project group</b>  | This criterion gives an indication of the qualifications of the project manager and project group. The project manager and project group will be assessed in relation to the following points: Project management; Expertise and experience within the field of research; Publication record; Experience with national and international collaboration on projects; Experience with supervision of students and younger researchers; The degree to which the project manager and project group are part of a research environment that has the competence and resources needed to ensure the success of the project  |
| <b>Candidate for fellowships/grants</b>   | This criterion gives an indication of the candidate's qualifications (as documented by a CV). The candidate for fellowships/grants will be assessed in relation to education, research experience and publication record.  |
| <b>Scientific management of the infrastructure</b>                                    | This criterion gives an indication of the quality of the plan for management of the infrastructure, and will be assessed in relation to the following points: Whether the applicant institution has the expertise and resources needed to establish, operate and make optimal use of the research infrastructure. Whether the project manager and project group have the expertise and resources needed to establish, operate and make optimal use of the research infrastructure. The scientific contribution of any partners to enhancing the quality and feasibility of the project. How the infrastructure will be made accessible to relevant users, including external users. The data management plan; i.e. plans for storing the data generated, and publishing or making it accessible in other ways. |
| <b>C Addressing the commitment and resources of the research environment/partners</b> |  |
| <b>User participation</b>   | This criterion gives an indication of whether those who will be utilising the R&D results have demonstrated an adequate degree of binding commitment regarding their involvement in the management and implementation of the project.  |
| <b>Strategic basis and importance</b>   | This criterion gives an indication of how the project incorporates, and the role it will play in relation to, the project owner's and partners' strategic objectives and plans as well as the relevant research challenges (e.g. subject-specific evaluations, research agendas and technology roadmaps, strategic activities and business plans).   |
| <b>International cooperation</b>  | This criterion gives an indication of the extent and quality of the international cooperation activities set out for the project.  |
| <b>6 Addressing compliance with general requirements/other aspects</b>                |  |
| <b>Internationalisation</b>   | In this context, internationalisation refers to the extent to which the project serves to promote the internationalisation of Norwegian research, by such means as: International networks. International mobility. Measures that enhance Norway's attractiveness as a host country for research activities  |

|   |   |
|---|---|
| <b>Ethical perspectives</b>                             | The Research Council emphasises the need for projects to maintain high ethical standards and not conflict in any way with the fundamental principles for ethics in research. More information on ethical perspectives may be found in the guidelines for ethics in research drawn up by the national committees for research ethics and in the Act on Ethics and Integrity in Research.   |
| <b>Gender balance in the project</b>                    | The Research Council works actively to enhance the gender balance in the Norwegian research sector. Each project can play a role in this by seeking to ensure gender balance in the composition of the project group.   |
| <b>Gender perspectives in the research</b>              | The Research Council views it as essential that gender perspectives are given adequate consideration in research projects where this is relevant. Good research must take into account biological and social differences between women and men, and the gender dimension should be one of the main pillars of the development of new knowledge. In research projects this dimension may be manifested through the research questions addressed, the theoretical approaches chosen, the methodology applied, and in the efforts to assess whether the research results will have different implications for women and men. |
| <b>Environmental impact</b>                             | The Research Council attaches importance to whether research projects give adequate consideration to any potential impacts (positive or negative) on the natural environment (external environment), when this is relevant. This applies both to the performance of the projects and to the utilisation of the results.   |
| <b>Recruitment of women</b>                             | The Research Council considers it important for projects to promote increased recruitment of women to higher academic positions and within the MST subject areas (mathematics, science and technology).   |
| <b>Distribution of national research responsibility</b> | This criterion gives an indication of the extent to which the project will contribute to the constructive distribution of tasks and responsibilities at the national level.   |
| <b>National cooperation</b>                             | This criterion gives an indication of the extent to which the project will make use of national research expertise and help to promote national network-building.   |
| <b>Additionality</b>                                    | This criterion gives an indication of the extent to which funding from the Research Council will affect the project by triggering efforts and actions by the target group partners that would not be achieved if the support had not been granted. Additionality will be assessed in relation to the following points: The impact of the funding in determining whether the project will or will not be realised, and the overall magnitude of the project. Whether the funding will lead to changes in the way the project is structured and implemented.  |

**Table A 18 Example of Description of RCN rating scale.**

|   |
|---|
| <b>For the criterion 'Scientific merit' the marks are described as follows:</b>   |
| <p><b>7 Exceptional:</b> The project's objectives, research questions and hypotheses are extremely clearly presented and are based on an exceedingly well-formulated and particularly original project concept. The project is at the very cutting edge of its field, and is of superior quality with no weak points. Publications in the top scientific journals in the field are extremely likely.</p> <p><b>6 Excellent:</b> The project's objectives, research questions and hypotheses are very clearly presented and are based on an excellently formulated and highly original project concept. The project is in the forefront of its field and will contribute to scientific innovation as well as generate important new knowledge. The project is of excellent quality, with no significant weak points. Publications in leading scientific journals in the field are highly likely.</p> <p><b>5 Very good:</b> The project's objectives, research questions and hypotheses are quite clearly presented and are based on a well-formulated and original project concept. The project will contribute to scientific innovation as well as generate new knowledge. The project is of very good quality, but has some minor weak points. Publications in recognised scientific journals in the field may be anticipated.</p> <p><b>4 Good:</b> The project's objectives, research questions and hypotheses are satisfactorily presented and are based on a good project concept. The project will generate new knowledge, but has some qualitative deficiencies. Publications in scientific journals in the field may be anticipated.</p> <p><b>3 Fair:</b> The project has not been presented adequately and/or has major qualitative deficiencies. It is not likely that any new knowledge will be generated.</p> <p><b>2 Weak:</b> The project has not been presented adequately and has such fundamental qualitative deficiencies that it will not be able to generate new knowledge.</p> <p><b>1 Poor:</b> The project has been presented so inadequately that it cannot be assessed in a reasonable manner.</p> |



## Appendix 3 Criteria in the European Peer Review Guide

European Peer Review Guide defines four general categories of evaluation criteria (ESF 2011:28-29, [www.esf.org](http://www.esf.org)):

### I. Relevance and expected impacts (driven by programme policy, strategy, mandates, etc.)

- Relevance of the proposed work to the scope of the call;
- Broader impact (scientific, knowledge creation, socio-economic, etc.);
- Incremental versus transformative gains;
- Associated risks;
- Requested resources:
  - budget: although it may be inevitable for some organisations to actually scrutinise the overall amounts requested by the proposers, it is more appropriate to avoid this and instead to assess the appropriateness of the cost items mentioned below that can be used as a measure of confirming the requested budget,
  - staff effort,
  - access to infrastructure,
  - equipment and consumables,
  - travel,
  - networking and dissemination;
- Ethical issues: compliance with standard norms and ethical practices when dealing with safety and security, use of animals and human subjects, environment, embargos and sanctions;
- Gender balance: some organisations pay specific attention to promote gender balance within their national programmes.

### II. Scientific quality

- Scientific/intellectual merits of the proposed research: clear, convincing and compelling;
- Thoroughness: definition of the problem and proposed solutions, review of state of the art;
- Novelty and originality:
  - unconventional,
  - potential for the creation of new knowledge, exciting new ideas and approaches,
  - use of novel technologies/methodologies,
  - innovative application of existing methodologies/technologies in new areas,
  - potential for the creation of new fundamental questions and new directions for research,
  - feasibility: scientific, technological, access to infrastructure, recruitment, project timeline, management plan and deliverables, associated risks,
  - appropriateness of the research methods, infrastructures, equipment and fieldwork.

### III. Applicant

- Academic qualifications and achievements in relation to their stage of career;
- Research experience and level of independence;
- Demonstrated expertise of the applicant(s) in similar projects;
- Applicants' scientific networks and ability to successfully disseminate research findings, i.e., knowledge transfer activities;
- Appropriateness of the team of applicants in terms of availability and complementarities of all the relevant expertise and synergies;
- Publication track record.

### IV. Research environment

- Availability and accessibility of personnel, facilities and infrastructures;
- Suitability of the environment to conduct the proposed research;

- Availability of other necessary resources;
- Mobility and career development aspects.

### ***Possible focus/additional criteria according to the target of the category of funding instrument***

(ESF 2011:55-72)

#### **Individual Research Programmes**

- Independent thinking and leadership abilities of the applicant;
- The balance between the disciplines involved in the case of interdisciplinary proposals.

#### **Career Developments Programmes**

##### Doctoral Training Grants

- The originality of the Ph.D. project;
- The feasibility (access to the resources, etc.) and the impact of its potential outcomes;
- Applicant's academic performance.

##### Postdoctoral Fellowships and Grants

- Scientific/technological quality and potential of the project;
- Training quality (relevance, capacity, complementary skills, etc.);
- Applicant (experience, publications, suitability to perform the project, etc.);
- Feasibility and implementation (access to infrastructure, management, practical arrangements);
- Impact (on career development).

##### Grants for the creation of Independent Research Groups

- Focus on person;
- Evidence of excellence (awards, achievements, publication record).

##### Advanced career grants

- Outstanding track record of research;
- Proven scholarly and scientific contributions;
- Scientific/research independence;
- Creativity and originality of proposed approaches;
- Unconventional methodologies and investigations.

#### **Collaborative Research Programmes**

- Relevance to the scope of the call (if the scientific scope is described in the call, for example, in the case of thematic calls);
- Evaluation of the applicant implies an evaluation not only of the competence of the project leader, but of the whole proposal team;
- The evaluation of broader impact may be left as a task solely for the panel review, and not necessarily for the individual experts;
- Evaluation of the leadership and management aspects;
- It is good practice to include some form of assessment of:
  - added value: why is a collaborative approach necessary?
  - integration: how well do the teams devoted to various components and work packages link together?
  - synergy: is the proposed work likely to yield benefits greater than the sum of the parts?
- In the specific case of National Collaborative Research Programmes the strategic and national importance of the proposed research should also be evaluated.

## **Programmes for the Creation or Enhancement of Scientific Networks**

- The scientific context and rationale for creating the network should be considered, e.g., why would such a network be needed or add value? (scientific quality is less relevant for evaluating as this instrument does not provide funding for research activities)
- Assessment of applicants might involve not only the core team submitting the proposal but also the wider network which they plan to form, and the criteria (possibly including diversity issues) to be used to that end;

## **Centres of Excellence Programmes**

- Scientific profile and excellence of the key leaders in the project;
- Excellence of the research plan;
- Feasibility of the research plan;
- Business plan including a proposed budget;
- Good management, governance oversight and clear strategic aims;
- Level of potential impact for the research system (at both national or international levels);
- Interdisciplinary nature of the project and collaborative efforts;
- Long-term potential impact and sustainability;
- For existing research centres: progress report in which is described the centre's progress in achieving its own goals and objectives since the last review was undergone.

Additional criteria:

- Whether the centre will provide an innovative and target-oriented research environment;
- Whether the application presents a clear and challenging research vision;
- Whether there is clear documentation of efficiency of the proposed administration;
- Critical mass of the researchers in the proposed centre;
- Promotion of young researchers and training at all stages – career progression;
- Gender balance;
- National and international collaboration/networking provided;
- Expected international impact;
- Societal impact.

## **New Research Infrastructures Programmes**

- Provide scope for unique, outstanding research;
- Represent a truly relevant resource to be used by several research groups/users with highly advanced research projects;
- Be of broad national or European interest;
- Have clear plans for maintenance and management of the infrastructure;
- Have a long-term plan addressing scientific goals, financing and use;
- Be open and easily accessible for researchers and have a plan for improving accessibility (concerns both use of the infrastructure, access to collected data and presentation of results).

Other criteria that may be addressed:

- Training requirements and availability of the programmes (e.g., seminars, workshops) associated with the infrastructures;
- Concepts for scientific service (e.g., sample preparation, data analysis, etc.);
- Contribution to the development or enhancement of relevant standards.

## Appendix 4 Funding instruments and criteria in mapped agencies

### NSF

#### Types of grant with special Guidelines to applicants

- Grants for Rapid Response Research (RAPID)
- EARly-concept Grants for Exploratory Research (EAGER)
- Ideas Lab
- Facilitation Awards for Scientists and Engineers with Disabilities (FASED)
- Proposals for Equipment
- Proposals Involving Vertebrate Animals
- Proposals Involving Human Subjects
- Proposals for Conferences
- Proposals to Support International Travel
- Support for Development of NSF Centers
- Support for Development of Major Research Equipment and Facilities

[http://www.nsf.gov/pubs/policydocs/pappguide/nsf15001/gpg\\_index.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf15001/gpg_index.jsp)

#### NSF Special Programs

- For Undergraduate Students
- For Graduate Students
- For Postdoctoral Fellows
- For K-12 Educators
- Small Business Programs
- For Veterans
- Broadening Participation

<http://www.nsf.gov/funding/>

#### NSF Types of grants

- STANDARD GRANT
- CONTINUING GRANT
- COST REIMBURSEMENT GRANT
- FIXED AMOUNT AWARD

[http://www.nsf.gov/pubs/manuals/gpm05\\_131/gpm2.jsp](http://www.nsf.gov/pubs/manuals/gpm05_131/gpm2.jsp)

**Funding types** in NSF's 'advanced funding search'<sup>90</sup> (in parentheses: number of active programmes with the funding type retrieved in search 10 March 2016):

- Standard Grant (256)
- Continuing Grant (225)
- Cooperative Agreement (58)
- Fellowship (12)
- 'Other' (24): Fixed Award Amount (Small Business Program; Small Business Innovation Research Program; 2 Small Business Technology Transfer Program); Fixed Amount Award with special reporting requirements; Doctoral Dissertation Research Improvement Grant (2); Master Cooperative Agreement with Cooperative Support Agreement(s); the possibility of five-year continuation; Cash Award (Individual) or Grant (Organizational); Supplement to Existing Award; supplement; Supplements, re-budgeting; Intel Agreement (i.e., Contract, Grant or Gift); Intel Sponsored Research Agreement;
- Standard and Continuing Awards for 3 to 5 years; contract vehicles as determined by the supporting agency; other funding mechanism (depending on the needs of the particular

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<sup>90</sup> [http://www.nsf.gov/funding/advanced\\_funding\\_search.jsp](http://www.nsf.gov/funding/advanced_funding_search.jsp)

awarding agency); Cooperative Agreement for the Management and Operation of the National Optical Astronomy Observatory; Cooperative Agreement - initial commitment of five years; Cooperative Agreement - 5 Year Period of Performance;

All: 387 active programmes, several of which offer multiple types of funding/grant types.

## **NWO**

### **Categories of NWO Funding instruments ('grant types')**

- Programmatic (95)
- Individual (54)
- Cooperation and Exchange (47)
- Investments (7)
- Big Facilities (5)
- Open Access (3)

<http://www.nwo.nl/en/funding>

### **NWO funding instruments by types of funding**

- Curiosity driven research and talent:
  - Free competition programme (All NWO divisions)
  - TOP Grants
  - TOP-PUNT Grants (for small teams of full professors at chemical centres of excellence)
  - Talent programmes
    - Aspasia for female talented researchers
    - FOM/f incentive programme for female scientists
    - Meervod (incentive for female lecturers)
    - PhDs in the Humanities
    - Rubicon (international mobility for young scientists)
    - Spinoza Prize for top researchers
    - NWO Talent Scheme (Veni, Vidi, Vici)
  - Gravitation programme
- Thematic research and PPP (supporting the top sectors):
  - Several programmes of the NWO-divisions: Earth and Life Sciences, Chemical Sciences, Physical Sciences, Humanities, Social Sciences, Physics and WOTRO, and NWO-wide funded programmes.
  - Three variants of public-private and public-public cooperation
- International collaboration programmes
- Grants for Large Research Facilities
- National institutes

<http://www.nwo.nl/en/funding>

## **NERC**

*Types of funding and award types/funding schemes under each type of funding*

Strategic research funding

- Highlight topics
- NERC Strategic Programmes
- Joint Strategic Response

Discovery science

- Standard grants
- Large grants
- Urgency grants

#### Innovation funding

- Innovation Projects
- Environmental Science Impact Programme
- Knowledge Exchange fellowships
- Innovation internships
- Follow-on Fund
- Pathfinder
- Innovation Projects call
- Policy Placement Scheme
- Strategic Research Impact Scheme

#### Postgraduate training

- Responsive training
  - Doctoral training partnerships
  - Large grants associated studentships
- Focused training
  - Centres for Doctoral Training
  - CASE studentships
  - Research programme grants associated studentships
  - Research programme competition studentships
  - Centre & survey studentships
- Advanced skills training
  - Policy internships
  - Environment YES
  - Advanced Training Short Courses
  - Research experience placements
  - Other training opportunities

#### Fellowships

- Independent Research Fellowships
- Daphne Jackson Fellowships (co-sponsored)

#### Capital funding

- ESIOS
- Ideas for New Strategic Science Capital
- Strategic Environmental Science Capital Calls

#### NERC National Capability Commissioning

- Funding of NC-science
- NC-large-scale research infrastructure (NC-LRI)
- NC-services, facilities and data (NC-SFD)
- NC-national and public good (NC-NPG)

In addition comes cross research council instruments that are externally lead: The Newton Fund; Belmont Forum.

### ***Vinnova - Structure of funding instruments***

Thematic programmes/Strategically important knowledge areas:

- Health
- Innovation system analysis
- Services and ICT
- Manufacturing and Working Life
- Transport and the Environment

Capacity development programmes/Innovativeness of specific target groups:

- Financing Innovation in Enterprises

- The incubator programme
- Innovation projects in companies
- Innovation voucher
- VINN verification
- The Knowledge triangle
  - Verification for growth
  - Key actors programme
  - Mobility for growth
- Public sector innovation
  - FRÖN
  - Idèslussar i kommuner
- Centre schemes/Individuals and Innovation Milieus
  - Berzelii Centra
  - Industry Excellence Centre programme
  - Test market
  - VINN Excellence Centre
  - VINNVÄXT

Cooperation programmes/Cross-boarder cooperation:

- Challenge-driven Innovation (UDI)
- Strategic Innovation Programmes(SIPs)
- International Cooperation

## Horizon 2020

**Table A 19 Horizon 2020 grant types and award criteria**

|  | Award criteria  |   |   |
|--|---|---|---|
|  | Excellence  | Impact  | Quality and efficiency of the implementation  |
| All types of actions (except Framework Partnership Agreement; see below)                   | Clarity and pertinence of the objectives; Soundness of the concept, and credibility of the proposed methodology;  | The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic;   | Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables; Appropriateness of the management structures and procedures, including risk and innovation management; Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise; Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role. |
| Research and innovation actions (RIA);<br>Innovation actions (IA) ; SME instrument actions | Extent that the proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)<br>Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge | Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society; Quality of the proposed measures to: <ul style="list-style-type: none"> <li>● Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.</li> <li>● Communicate the project activities to different target audiences (not applicable to SME Instrument, phase 1)</li> </ul> | (For SME instrument phase 2) Best value for money of subcontracts is assessed*  |

|   |   |   |   |
|---|---|---|---|
| Coordination & support actions (CSA)  | Quality of the proposed coordination and/or support measures.   | Quality of the proposed measures to: • Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant. • Communicate the project activities to different target audiences  |   |
| ERA-NET Cofund actions  | Level of ambition in the collaboration and commitment of the participants in the proposed ERA-NET action to pool national resources and coordinate their national/regional research programmes. | Achievement of critical mass for the funding of trans-national projects by pooling of national/regional resources and contribution to establishing and strengthening a durable cooperation between the partners and their national/regional research programmes; Quality of the proposed measures to: • Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant. • Communicate the project, to activities to different target audiences |   |
| Pre-commercial procurement (PCP)/ Public procurement of innovative solutions (PPI) action | Progress beyond the state of the art in terms of the degree of innovation needed to satisfy the procurement need.   | Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global procurement markets Quality of the proposed measures to • Exploit and disseminate the project results (including management of IPR) and to manage research data where relevant. • Communicate the project activities to different target audiences More forward-looking concerted procurement approaches that reduce fragmentation of demand for innovative solutions.   |   |
| EJP Cofund actions  | Level of ambition in the collaboration and commitment of the participants in the proposed action to pool national resources and coordinate their national/regional research programmes.         | Critical mass in terms of proposed overall budget, maturity and degree of integration in the proposed research area as well as consistency of proposed activities with the development of a European Joint Programme towards a joint undertaking or other permanent structure in the proposed research area. Effectiveness of the proposed measures to exploit and disseminate the programme's results and to communicate the programme.  |   |
| Framework Partnership Agreements (FPA)  | Clarity and pertinence of the objectives;   | The extent to which the action plan of the FPA would contribute to each of the expected impacts mentioned in the work programme under the relevant topic.   | Complementarity of the partners, and balance of expertise ; Potential for long term cooperation among the partners. |

\*For SME instrument phase 2 subcontracting has a crucial impact on the quality and efficiency of the implementation criteria.



**Table A 20 Assessment criteria for ERC frontier grants**

|   |   |
|---|---|
| <b>Criteria assessing the Proposed research</b>           | <b>Starting, Consolidator and Advanced</b>  |
| Ground-breaking nature, ambition and feasibility          | <p><u>Ground-breaking nature and potential impact of the research project:</u></p> <ul style="list-style-type: none"> <li>• <i>To what extent does the proposed research address important challenges?</i></li> <li>• <i>To what extent are the objectives ambitious and beyond the state of the art (e.g. novel concepts and approaches or development across disciplines)?</i></li> <li>• <i>To what extent is the proposed research high risk/high gain?</i></li> </ul>  |
|   | <p><u>Scientific approach:</u></p> <ul style="list-style-type: none"> <li>• <i>To what extent is the outlined scientific approach feasible bearing in mind the extent that the proposed research is high risk/high gain (based on the Extended Synopsis)?</i></li> <li>• <i>To what extent is the proposed research methodology appropriate to achieve the goals of the project (based on the full Scientific Proposal)?</i></li> <li>• <i>To what extent does the proposal involve the development of novel methodology (based on the full Scientific Proposal)?</i></li> <li>• <i>To what extent are the proposed timescales and resources necessary and properly justified (based on the full Scientific Proposal)?</i></li> </ul> |
| <b>Criteria Assessing the Principle Investigator (PI)</b> | <b>Starting and Consolidator</b>  |
| Intellectual capacity, creativity                         | <ul style="list-style-type: none"> <li>• <i>To what extent has the PI demonstrated the ability to propose and conduct ground-breaking research?</i></li> <li>• <i>To what extent does the PI provide evidence of creative independent thinking?</i></li> <li>• <i>To what extent have the achievements of the PI typically gone beyond the state of the art?</i></li> </ul>   |
| Commitment  | <i>To what extent does the PI demonstrate the level of commitment to the project necessary for its execution and the willingness to devote a significant amount of time to the project (min 50% for Starting and 40% for Consolidator of the total working time on it and min 50% in an EU Member State or Associated Country) (based on the full Scientific Proposal)?</i>   |
|   | <b>Advanced</b>   |
| Intellectual capacity and creativity                      | <ul style="list-style-type: none"> <li>• <i>To what extent has the PI demonstrated the ability to propose and conduct ground-breaking research?</i></li> <li>• <i>To what extent does the PI provide evidence of creative independent thinking?</i></li> <li>• <i>To what extent have the achievements of the PI typically gone beyond the state of the art?</i></li> <li>• <i>To what extent has the PI demonstrated sound leadership in the training and advancement of young scientists?</i></li> </ul>  |
| Commitment  | <i>To what extent does the PI demonstrate the level of commitment to the project necessary for its execution and the willingness to devote a significant amount of time to the project (min 30% of the total working time on it and min 50% in an EU Member State or Associated Country) (based on the full Scientific Proposal)?</i>   |

# NIFU

Nordic Institute for Studies in  
Innovation, Research and Education



## RCN Reviewer Survey

The purpose of this survey is to map experiences with the RCN review criteria and provide input to RCN's ongoing efforts to improve its review criteria. Your experiences with applying the RCN review criteria and guidelines are of great importance for the RCN, and we kindly ask you to participate in this survey.

1. According to information from the RCN, you reviewed the following types of RCN proposals in 2015:

|   | Yes                   | No                    |
|---|-----------------------|-----------------------|
| Researcher projects                                 | <input type="radio"/> | <input type="radio"/> |
| Knowledge-building Projects for Industry (KPN)      | <input type="radio"/> | <input type="radio"/> |
| Innovation Projects for the Industrial Sector (IPN) | <input type="radio"/> | <input type="radio"/> |

In this survey you will be posed questions concerning the review criteria of the kind of proposals indicated above. If the checked categories are incorrect, please amend by selecting the correct kind of proposals.

Start

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## RCN Reviewer Survey

### Researcher Projects

The standard review form for RCN Researcher projects asks for assessments on seven criteria. For each of them, please indicate your assessment of its importance and clarity.

2. **Importance:** I think this is an important criterion when assessing Researcher projects.

|   | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot say            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a) Scientific merit                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b) Project management and the Project group     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c) Implementation plan and resource parameters  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d) National cooperation                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e) International cooperation                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f) Dissemination and communication of results   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g) Relevance relative to the call for proposals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

3. **Clarity:** I think the RCN guidelines for this criterion are clear/easy to understand.

|   | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot remember/Cannot say |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|
| a) Scientific merit                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| b) Project management and the Project group     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| c) Implementation plan and resource parameters  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| d) National cooperation                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| e) International cooperation                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| f) Dissemination and communication of results   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| g) Relevance relative to the call for proposals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |

4. When comparing the RCN criteria for Researcher projects to those used for assessing similar applications in other funding agencies you know, are the RCN criteria better, about the same or poorer:

|   | Better                | About the same        | Poorer                | Not relevant/Cannot say |
|---|-----------------------|-----------------------|-----------------------|-------------------------|
| In terms of covering the aspects that are important to assess | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of only including important aspects                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to understand for the reviewers        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to use for the reviewers               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |

NB: Leave open if you do not have experiences from assessing similar applications for other funding agencies.

5. **Comments:** Please give your comments concerning your overall experience with the criteria and guidelines for reviewing proposals for RCN Researcher projects and possible areas for improvement.



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## RCN Reviewer Survey

### Knowledge-building Project for Industry (KPN)

The standard review form for RCN Knowledge-building Project for Industry asks for assessments on four criteria. For each of them, please indicate your assessment of its importance and clarity.

6. **Importance:** I think this is an important criterion when assessing KPN proposals.

|  | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot say            |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a) Level of research                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b) Scientific merit                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c) The project manager and project group       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d) Implementation plan and resource parameters | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

7. **Clarity:** I think the RCN guidelines for this criterion are clear/easy to understand.

|  | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot remember/Cannot say |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|
| a) Level of research                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| b) Scientific merit                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| c) The project manager and project group       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| d) Implementation plan and resource parameters | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |

8. When comparing the RCN criteria for KPN projects to those used for assessing similar applications in other funding agencies you know, are the RCN criteria better, about the same or poorer:

|   | Better                | About the same        | Poorer                | Not relevant/Cannot say |
|---|-----------------------|-----------------------|-----------------------|-------------------------|
| In terms of covering the aspects that are important to assess | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of only including important aspects                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to understand for the reviewers        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to use for the reviewers               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |

NB: Leave open if you do not have experiences from assessing similar applications for other funding agencies.

9. **Comments:** Please give your comments concerning your overall experience with the criteria and guidelines for reviewing proposals for KPN projects and possible areas for improvement.

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## RCN Reviewer Survey

### Innovation Projects for the Industrial Sector (IPN)

The standard review form for RCN Innovation Projects for the Industrial Sector asks for assessments on six criteria. For each of them, please indicate your assessment of its importance and clarity.

10. **Importance:** I think this is an important criterion when assessing IPN proposals.

|   | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot say            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a) Level of innovation                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b) Potential for value creation for industrial partners | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c) Realisation of the innovation                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d) Level of research                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e) R&D project quality                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f) Implementation capacity                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**The criteria in Norwegian:**

Level of innovation - Innovasjonsgrad

Potential for value creation for industrial partners - Verdiskapingspotensial for bedriftspartnere

Realisation of the innovation - Realisering av innovasjonen

Level of research - Forskningsgrad

R&D project quality - Prosjektkvalitet for FoU-prosjektet

Implementation capacity - Gjennomføringsevne

11. **Clarity:** I think the RCN guidelines for this criterion are clear/easy to understand.

|   | 5 To a high degree    | 4                     | 3                     | 2                     | 1 Not at all          | Cannot remember/Cannot say |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|
| a) Level of innovation                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| b) Potential for value creation for industrial partners | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| c) Realisation of the innovation                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| d) Level of research                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| e) R&D project quality                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |
| f) Implementation capacity                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      |

12. When comparing the RCN criteria for IPN projects to those used for assessing similar applications in other funding agencies you know, are the RCN criteria better, about the same or poorer:

|   | Better                | About the same        | Poorer                | Not relevant/Cannot say |
|---|-----------------------|-----------------------|-----------------------|-------------------------|
| In terms of covering the aspects that are important to assess | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of only including important aspects                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to understand for the reviewers        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |
| In terms of being easy to use for the reviewers               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   |

NB: Leave open if you do not have experiences from assessing similar applications for other funding agencies.

13. **Comments:** Please give your comments concerning your overall experience with the criteria and guidelines for reviewing proposals for IPN projects and possible areas for improvement.



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## RCN Reviewer Survey

### Background information

14. Please indicate your age and gender.

Select age ▼  
Select gender ▼

15. Please indicate your sector of employment.

- University/Higher education institution
- Independent research institute
- Industry/Private enterprise
- Public administration
- Other (including NGOs)

16. Please indicate your field of research/expertise.

- Natural sciences
- Engineering and technology
- Medical sciences
- Agricultural sciences
- Social sciences
- Humanities
- Others

17. Please indicate your current country of residence.

- Norway
- Nordic country, apart from Norway (Denmark, Finland, Iceland, Sweden)
- Europe, apart from the Nordic countries
- Outside Europe

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