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How Research Funders Ensure the Scientific Legitimacy of their Decisions

Investigation in support of the design of Formas scientific management

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Summary

This report was commissioned by Formas, to inform its decision-making about scientific management and how it ensures the scientific quality and legitimacy of its decisions. Formas' structure and organisation were designed when it was much smaller than today. In particular, it is not clear that the traditional arrangement with a 'secretary general' (*huvudsekreterare*) who provides scientific quality control of funding processes and decisions and aims to ensure that proposed programming decisions are scientifically based, is sustainable in the new context. The report therefore looks at how equivalent processes for ensuring the scientific legitimacy of decisions work elsewhere by looking at five other Swedish funders and five international examples.

The use of quality control mechanisms outside the normal hierarchy of committees and administration turns out to be confined to the four funders that are researcher governed. All funders rely on peer and expert review so that – while there may be ways for higher levels to check the process and ratify the decisions – *de facto* it is review panels that make funding decisions. To varying degrees, all the funders considered are transparent about how they make decisions, both in terms of the information they share with applicants and the outside world and in terms of the ability of higher decision-levels within the organisation to scrutinise processes done at lower levels. Except in the researcher-governed funders, this is normally considered adequate to ensure scientific quality and legitimacy.

Peer and panel review of proposals in 'bottom-up' or 'response-mode' programmes is well understood and conceptually simple. A difficulty most of the funders have to manage is to define and maintain an appropriate balance between the need to fund high-quality science and the requirement in thematic programmes for the research to be societally relevant. Funders tend to manage these two types of programme separately, using different assessment criteria and often different types of panel (e.g. involving 'user' or societal representatives in addition to academic experts when funding thematic research). In many cases, scientific and non-scientific criteria are assessed at the same time (typically including remote review followed by a panel decision), but this can lead to lack of clarity about how specific project funding decisions are actually made. The alternative is to assess proposals sequentially: this can mean scientific peer review first and then consideration of non-scientific criteria second (e.g. by peer review at the first stage and panel review including non-academics at the second) or vice versa (e.g. an outline-proposal detailing thematic relevance first and peer review second). The advantage of sequential treatment is that it makes the judgement of scientific quality unambiguous, providing a clearer basis for trust in the assessment process as a whole. In whatever order the assessment is done, there is a clear scientific quality test that filters out scientifically sub-standard proposals.

Not all funders use the kind of rigid distinction between scientific committees and administration seen in research councils. NERC (UK) and NWO (Netherlands) have both reorganised lately in ways that reduce this distinction while maintaining scientific oversight within the organisation. While all the funders consult with their beneficiary communities, three have started to do so through external processes, opening up future research prioritisation to the wider research community (and also in the Netherlands to the public) as part of a process of increasing wider trust in them as useful organisations.

Based on international experience, Formas could consider at least the following options for future scientific management (in addition to the *status quo*).

- Further increase the internal and external transparency of proposal selection processes, replacing quality control by a secretary general with quality assurance through open processes. This could be accompanied by further development of processes for selecting peer and panel reviewers
- Increase the role of the Scientific Council in oversight and especially in programme planning, avoiding the need for separate quality control processes
- Implement multi-stage assessment processes, separating scientific and societal assessments
- Alternatively, the present system could be extended by having three secretaries general (one per department) or introducing scientific committees for each department. These solutions would however be relatively inefficient

Sammanfattning

Denna rapport har framtagits på uppdrag av Formas som underlag för beslut om hur myndigheten ska organisera sin vetenskapliga ledning för att säkerställa vetenskaplig kvalitet och legitimitet i sina beslutsprocesser. Formas struktur och organisation utformades när rådet var mycket mindre än idag. Framför allt är det inte uppenbart att den traditionella lösningen med en huvudsekreterare som säkerställer den vetenskapliga kvaliteten i finansieringsprocesser och beslut, och som syftar till att säkerställa att föreslagna programplaneringsbeslut är vetenskapligt välgrundade, är hållbar i den nya situationen. Rapporten studerar därför hur motsvarande processer för att säkerställa besluts vetenskapliga legitimitet hanteras av andra finansiärer genom att betrakta fem andra svenska och fem internationella finansiärer.

Användningen av kvalitetssäkringsmekanismer utöver den normala ordningen med kommittéer och administration visar sig vara begränsad till fyra forskarstyrda finansiärer. Alla finansiärer som vi studerade förlitar sig på sakkunnig- och expertgranskning så att – även om det finns möjlighet för högre beslutsnivåer att kontrollera processen och ratificera besluten – är det *de facto* bedömningspaneler som fattar finansieringsbesluten. I varierande utsträckning anses alla finansiärer vara transparenta i hur de fattar beslut, såväl vad gäller den information som ges sökande och omvärld som vad gäller möjligheten för högre beslutsnivåer inom organisationen att granska processer som bedrivs på lägre nivåer. Förutom i de forskarstyrda finansiärerna anses detta normalt vara tillräckligt för att säkerställa vetenskaplig kvalitet och legitimitet.

Sakkunnig- och panelgranskning av ansökningar till *bottom up* program är välkända och konceptuellt enkla. En svårighet som de flesta finansiärer måste hantera är att definiera och upprätthålla en lämplig balans mellan behovet av att finansiera högkvalitativ forskning och kravet i tematiska program att forskningen ska vara samhällsrelevant. Finansiärer tenderar att hantera dessa två typer av program olika genom olika bedömningskriterier och ofta olika slags paneler (t.ex. med "användare" eller samhällsrepresentanter i tillägg till akademiska experter när de finansierar tematisk forskning). I många fall bedöms vetenskapliga och icke-vetenskapliga kriterier samtidigt (vanligtvis genom vetenskaplig granskning på distans följt av panelbeslut), men detta kan leda till bristande tydlighet när det gäller hur enskilda finansieringsbeslut faktiskt fattas. Alternativet är att utvärdera förslag sekventiellt: detta kan innebära vetenskaplig granskning först och därefter bedömning av icke-vetenskapliga kriterier (t.ex. genom referentgranskning i ett första steg och panelgranskning med icke-akademiker i ett andra) eller vice versa (t.ex. en kort ansökan som preciserar tematisk relevans först och referentgranskning därefter). Fördelen med sekventiell behandling är att bedömningen av vetenskaplig kvalitet blir entydig, vilket lägger en tydligare grund för förtroende för bedömningsprocessen som helhet. I vilken ordning bedömningen än görs finns det ett tydligt vetenskapligt kvalitetstest som eliminerar ansökningar av undermålig vetenskaplig kvalitet.

Alla finansiärer tillämpar inte den tydliga åtskillnad mellan vetenskapliga kommittéer och administration som återfinns hos forskningsråd. NERC (UK) och NWO (Nederländerna) har båda nyligen omorganiserats på sätt som minskar denna skillnad, samtidigt som de behåller vetenskaplig insyn inom organisationen. Medan alla finansiärer samråder med sina stödmottagare har tre börjat göra det genom externa processer, vilket öppnar prioriteringen av framtida forskning till det bredare forskarsamfundet (och i Nederländerna även till allmänheten) som ett led i en process för att öka förtroendet för dem som allmännyttiga organisationer.

Baserat på internationella erfarenheter kan Formas överväga åtminstone följande alternativ för sin framtida vetenskapliga ledning (utöver *status quo*).

- Förbättra den interna och externa transparensen i processen för urval av ansökningar genom att ersätta kvalitetssäkring gjord av en huvudsekreterare med kvalitetssäkring genom öppna processer. Detta kan åtföljas av vidareutveckling av processer för att välja granskare och panelledamöter
- Öka Forskarrådets roll i tillsyn och särskilt i programplanering, och undanröj därmed samtidigt behovet av separata kvalitetssäkringsrutiner

- Inför flerstegsprocesser i bedömning för att separera vetenskaplig och samhällelig granskning
- Alternativt kan det nuvarande systemet utökas genom att ha tre huvudsekreterare (en per avdelning) eller genom att införa vetenskapliga kommittéer för varje avdelning. Dessa lösningar skulle emellertid vara relativt ineffektiva

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1 Introduction

This document presents the findings of the ‘Investigation in support of the design of Formas scientific management’, Commissioned by Formas in June 2018 and carried out by Technopolis/Faugert & Co. The aim of this study is to map and describe how a range of other research funding organisations comparable to Formas ensure scientific quality and legitimacy. Based on this analysis, it describes alternative models, yielding strategic guidance and support for Formas in the optimisation of its scientific management.

More specifically, we discuss where people are needed with high levels of scientific competence, recognised by the research community, in order to ensure the scientific quality and legitimacy of decisions. We describe models of the relationship between the scientific and managerial leadership in order to ensure that responsibilities and authority are clear and avoid role conflicts. We work with the following definition of ‘scientific legitimacy’.

Scientific ‘legitimacy’ means that, in the eyes of the research community, the research funder’s decisions on both funding outcomes and future funding programmes have been taken based on science-led processes and take proper account of the need for scientific excellence, as defined by that community.

1.1 The context for this study – structure and processes at Formas

Formas was created in 2001 as part of a wider research funding reform in Sweden. It resulted from a long debate about the extent to which the research community or wider society should control research funding. So-called ‘sector’ research – namely research in areas like energy, construction or agriculture done with specific societal purposes in mind and funded by organisations in which the research community did not have ultimate control of funding decisions – had grown significantly since the 1960s.

The 2001 reform merged existing researcher-controlled research councils to form the Swedish Research Council and three innovation funders to form Vinnova. Sector funders were merged to form the Formas and FAS (now Forte) research councils. Their governing bodies contain a majority of academics elected by the universities, shifting them from being controlled by government appointees to researchers. All three research councils have ‘secretaries general’ (*huvudsekreterare*) who oversee decision processes about funding and the design of future programmes to ensure that decisions are taken on a sound scientific basis and therefore legitimate in the eyes of the research community.

In 2001, Formas’ budget was SEK 400m. Currently, its budget is SEK 1,400m and its remit is considerably broader, including not only researcher-initiated research but also thematic research. Formas, like all research funders, is experiencing an increased volume of multidisciplinary proposals. An increasing proportion of its funding is awarded in cooperation with other agencies and a growing part of its work has an international component. Recently, Formas has been instructed to go beyond funding academic institutions and also to fund companies. These patterns of change mean that it is useful to review the continuing appropriateness of Formas’ organisational structure for assuring the quality of the research that it funds and the associated processes.

The Scientific Council (*forskarrådet*) is the highest-level scientific committee, taking decisions such as the thematic directions and budgets of specific programmes and approving the funding decisions of the thematic panels (*beredningsgrupper*) about both programmed and bottom-up project proposals. The thematic panels’ membership is both Swedish and international, and specific configurations may be convened to address the needs of specific calls for proposals. They are therefore not sub-committees of the Science Council but operate separately. Their process is conventional: sub-groups from the panel assess individual proposals (using external reviewers, in cases where they need additional expertise). The sub-groups then present their findings to the panel, which ranks the proposals.

Programme budgets are decided in advance by the Science Council. In the bottom-up calls, the budget allocated to each panel is based on demand pressure. Projects are approved down the ranking list until the budget runs out. Panels do not have to allocate the size of grant requested by the applicant but can adjust this as they see fit. New programmes are usually initiated following a period of analysis, which is accompanied by an academic panel.

Within the staff, the director-general is responsible for overall management while the secretary-general provides the link between the thematic panels and the Scientific Council. S/he also supports the Council in preparing decisions about thematic priorities, based on analysis and scientific advice. The secretary-general quality-assures the process of selecting panel members for approval and guarantees the integrity of the assessment process and the accuracy of the results. Because these matters are relevant to making scientific decisions about excellence, it is seen as important that the secretary-general has a strong reputation as a scientist, ensuring the integrity and legitimacy of the funding decisions passed to the Science Council for overall approval. It follows, in turn, that at least some of the Senior Research Officers administering funding decisions (such as those who support the initial allocation of proposals to panels or who identify and propose panel members and external referees) need a level of scientific competence. In practice, most have a PhD and some have subsequent research experience.

1.2 The approach of this study – comparators in Sweden and beyond

Our findings are based on an analysis of how scientific quality and legitimacy are ensured at ten comparator funders – five from Sweden and five from abroad. Table 1 shows the funders we have studied. They were chosen in discussion with Formas to provide a spectrum from traditional ‘bottom up’ or ‘response-mode’ funding of investigator-initiated proposals (Swedish Research Council) to innovation (Vinnova). It is noteworthy that most of the funders have increasingly to address societally-relevant research, sometimes in addition to response-mode funding.

Our method for collecting information on each funder is based on desk research and interviews with administrative and academic individuals at each funder is presented in Appendix A. Comparative analysis between these ten funders has identified different models and approaches and enabled us to present the conclusions drawn in this report, including the possible implications for future directions at Formas.

Table 1: Comparator funders

Organisation	Abb.	Country	Rationale for inclusion
Swedish Research Council	VR	Sweden	The largest funder of traditional, investigator-initiated research in Sweden, mostly in a traditional mode but also having to deal with thematic requirements imposed by government
Forte	-	Sweden	Established at the same time as Formas and involving a similar transformation of sector research funding into research council funding – while having to ensure relevance as well as pure scientific quality
Vinnova	-	Sweden	Funds research for innovation, often in academic-industry partnership, making extensive use of peer and panel review in proposal assessment. VINNOVA (and NUTEK Teknik before it) has always been under strong pressure to ensure and legitimate the quality of the research it funds, both in ex ante assessment and in ex post evaluation
Swedish Energy Agency	SEA	Sweden	The agency funds a wide spectrum of research from ‘basic’ research through to development and demonstration. In the past there was a debate about scientific quality, which has its roots in the agency’s ‘sector research’ role and the rapid expansion of energy research in the 1970s and 1980s, but this has now abated.
Strategic Research Foundation	SSF	Sweden	One of the Wage-Earner Fund Foundations, SSF stands formally outside but still relates fairly closely to national research and innovation policy. Initially, it was an important ‘change agent’, establishing graduate schools and taking over some of NUTEK Teknik’s (a predecessor to Vinnova) responsibilities for key emerging technologies. It is strongly focused on funding projects that are both excellent and socially relevant

Organisation	Abb.	Country	Rationale for inclusion
Research Council of Norway	RCN	Norway	Norway has a somewhat smaller size and strength of research system than Sweden but is geographically close by, funds basic and thematic/strategic research as well as innovation. RCN has a range of 'proposal types', with different assessment processes intended to reflect the balance between basic, applied and innovation research that is needed in each particular programme and has recently reviewed these and the associated processes, following criticism from an external spending review
Academy of Finland	-	Finland	Similar size and strength of research system to Sweden, geographical proximity, funds basic research bottom up as well as within scientifically defined thematic priorities
Natural Environment Research Council	NERC	UK	This is the research council in the UK most similar to Formas in terms of its thematic mission. It has recently altered its governance structure in order to find a better balance between scientific legitimisation and the demands of society.
Netherlands Organisation for Scientific Research	NWO	Netherlands	Slightly larger size and strength of research system than Sweden, funds basic research and research involving businesses, funds thematic research
Swiss National Science Foundation	SNSF	Switzerland	Similar size and strength of research system to Sweden, funds basic research, research involving businesses and thematic research needed to develop the research system or to generate information for policy

We have focused our analyses on the mainstream activities of these organisations. Thus, we do not consider the Strategic Research Council at the Academy of Finland or the management of research institutes and infrastructures at VR, NERC and NWO.

Table 2 shows the top governance of the funders considered, together with that of Formas. The three Swedish research councils are researcher-governed as, in effect, is the Swiss SNSF, whose governing body comprises representatives of the university system and a minority of government appointees. These four organisations have mechanisms external to the administration to ensure the scientific legitimacy of decisions: the secretaries general in Sweden, and the Compliance Commission at the SNSF, which reports to the governing Foundation Council. The others rely on internally quality-assured and transparent processes to ensure legitimacy. It is clear that – while there is a range of different processes for approving or ratifying funding decisions – these are de facto made at the level of the responsible panels and are rarely overturned at higher levels. The competence and integrity of panellists and the processes they use therefore form the basis for funding decisions and their scientific and societal legitimacy.

All the funders we studied have meticulous conflict-of-interest processes. All the funder representatives we interviewed – whether on the administrative or the academic side – felt that the decisions taken in their funding organisation were scientifically legitimate. Forte, the Swedish Energy Agency and Vinnova (or their predecessor organisations) have suffered legitimacy problems in the past but no longer believe these are current.

Table 2: Funders' governance

Organisation	Highest strategic decision-maker, answering to the 'owner'	Appointed by ...	Highest academic instance	Who de facto makes funding decisions
Formas	Scientific Council	6 appointed by ministries (including the DG); 7 elected by university community	Scientific Council*	Panels
Swedish Research Council	Board	3 (including the DG) appointed; 6 elected by university community	3 Discipline Councils + various funding committees	Panels
Forte	Board	5 appointed by government (including the DG); 7 elected by university community	Board*	Panels
Vinnova	Board	Government	None	Panels+
Swedish Energy Agency	Director-General	Government	Energy Development Board	Programme panels+
Strategic Research Foundation	Board	Funding agencies and academies (8), government (2)	No separate academic committees	Panels
Research Council of Norway	Executive Board	Appointed by the Ministry of Education and Research	Division Boards++	Programme Boards
Academy of Finland	Board	Government	Research Councils*	Research Councils
Natural Environment Research Council	Council	Appointed by government via UKRI	Science Board	Panels
Netherlands Organisation for Scientific Research	Executive Board	Government	Domain Boards	Panels
Swiss National Science Foundation	Foundation Council	Members are delegates from universities and government (a small minority)	National Research Council (chair and division heads ratify)	Panels

* Ratifies funding decisions. +Legally, only officers of the agency can take funding decisions, but panel recommendations are rarely ignored. ++ Except for Centres of Excellence funding, which is approved by the Executive Board

2 Two dimensions of scientific management

Scientific management – ensuring the scientific quality and legitimacy of a research funder’s decisions – falls into two broad types. Most of the funders we consider need both. We refer to them respectively as ‘process assurance’ and ‘criteria balancing’.

Process assurance: This aspect is purely about ensuring that all aspects of the review process have been conducted to high scientific standards using sound processes and are as far as possible without errors. Typical points of enquiry are

- Have reviewers with suitable expertise been selected to review a proposal?
- Are the reviews (especially from external experts) of suitable quality and depth?
- Have conflicts of interest been avoided (for reviewers and panellists)?
- Are the reasons behind the final judgement of a proposal’s scientific quality un-ambiguous and well-documented?

These questions are all about the purely scientific aspect of a research funder’s activities. They do not relate to wider strategic considerations (e.g. to thematic or policy imperatives). This is an important task with both a quality-assuring and legitimacy-granting function.

Criteria balancing: This aspect is about the thematic, strategic and policy influences that shape the funder’s mission. This dimension of scientific management is chiefly about ensuring that excellent science is funded *and* that the funder’s thematic or extra-scientific missions are achieved. Typical points of enquiry are

- How is scientific quality of proposals balanced against considerations of thematic relevance or potential non-academic use of the proposed research?
- Do scientific quality considerations conflict with other considerations and have these conflicts been minimised?
- Are new programmes (potentially mandated from the policy world) set up in such a way that excellent science can be funded through them?
- Are the backgrounds and qualifications of those involved in the review and selection process (and for programme design) appropriate for ensuring that both the scientific and extra-scientific aims and criteria can be properly assessed?

This second aspect of scientific management derives from the fact that all funders we have considered here have multiple aims. One of them is always to fund excellent science and indeed, all hold the view that research of poor scientific quality is not to be funded. However, especially in recent decades, other aims relating to societal, political or thematic relevance have come into play. The ‘criteria balancing’ aspect of scientific management is about ensuring that these two sets of aims can co-exist and, ideally, reinforce each other.

Whilst the ‘process assurance’ aspect focuses on whether the process of judging scientific quality is working properly in itself, the ‘criteria balancing’ aspect focuses on ensuring that other considerations are properly handled but do not override or compromise scientific judgement. In the following sections, we deal with each of these two dimensions separately, as the solutions to these two aspects of scientific management are fundamentally distinct and pertain to different types of funding process.

3 Process assurance

Across all the funders we have considered, the main legitimacy-granting aspect of funders' decision-making processes is peer review itself, including external (remote) peer review. Across countries, there is a high level of trust in the 'institution' of peer review. Especially in smaller countries, international review is seen as helpful in ensuring legitimate processes leading to high-quality science being funded. Recruiting reviewers from the international arena is firstly understood to help avoid conflicts of interest, and secondly to benchmark national research against international standards.

The integrity of the process of scientific review, from initial reviewer selection to funding recommendation or 'ranking', is not a source of major concern among the funders we have considered. An exception to this is the risk of conflicts of interest, so processes to avoid such conflicts are almost always explained in some detail in public documents.¹ Nevertheless, all funders have mechanisms in place that safeguard the integrity – and therefore the legitimacy – of the scientific review process.

We find two main mechanisms in this context. Foremost, funders ensure a high degree of information transparency, sometimes coupled with an appeals process that becomes feasible through available information on the funding process. Second, one funder (SNSF) has put in place a commission tasked with spot-checking the review process.

3.1 Transparency

Transparency of the scientific review process occurs both between the process stages themselves, as well as between the process and the applicant. Various, funders ensure that several different types of information are collected and made available – either within the funding organisation, or to the applicants, or to the wider public. This may include the following types of information:

- Marks and/or comments given by the (external) reviewers
- Marks and/or comments given by the panels
- Names of the reviewers/panel members who assessed each application
- Referees' and/or reviewers' reports
- Applicants' rebuttals
- The description of the assessment procedure
- The composition of the panels/committees involved in the decision-making
- Details of how conflicts of interest were checked and the results of that process.

Not all funders make all these information types available. Approaches differ here, but ensuring that the people involved in the decisions and the grounds for decisions themselves are available to at least one subsequent 'stage' in the funding process (and usually more widely) is a universal practice to ensure the transparency necessary for potential errors or malpractice in the process to be identifiable. NWO in the Netherlands has an especially high degree of transparency, where information is made available as relevant to each subsequent stage of the funding process.

¹ These processes range from self-declaration and manual checks by administrators to automated checks. The latter is not practiced by any of the funders we have considered here. However, we are aware from previous work that the Australian Research Council (ARC) has an applications management system that can scan automatically for conflicts of interest through factors such as previous co-publications, departmental or institution affiliation and common association with previous research grants between proposal author and potential reviewer.

Example: information availability at NWO (Netherlands)

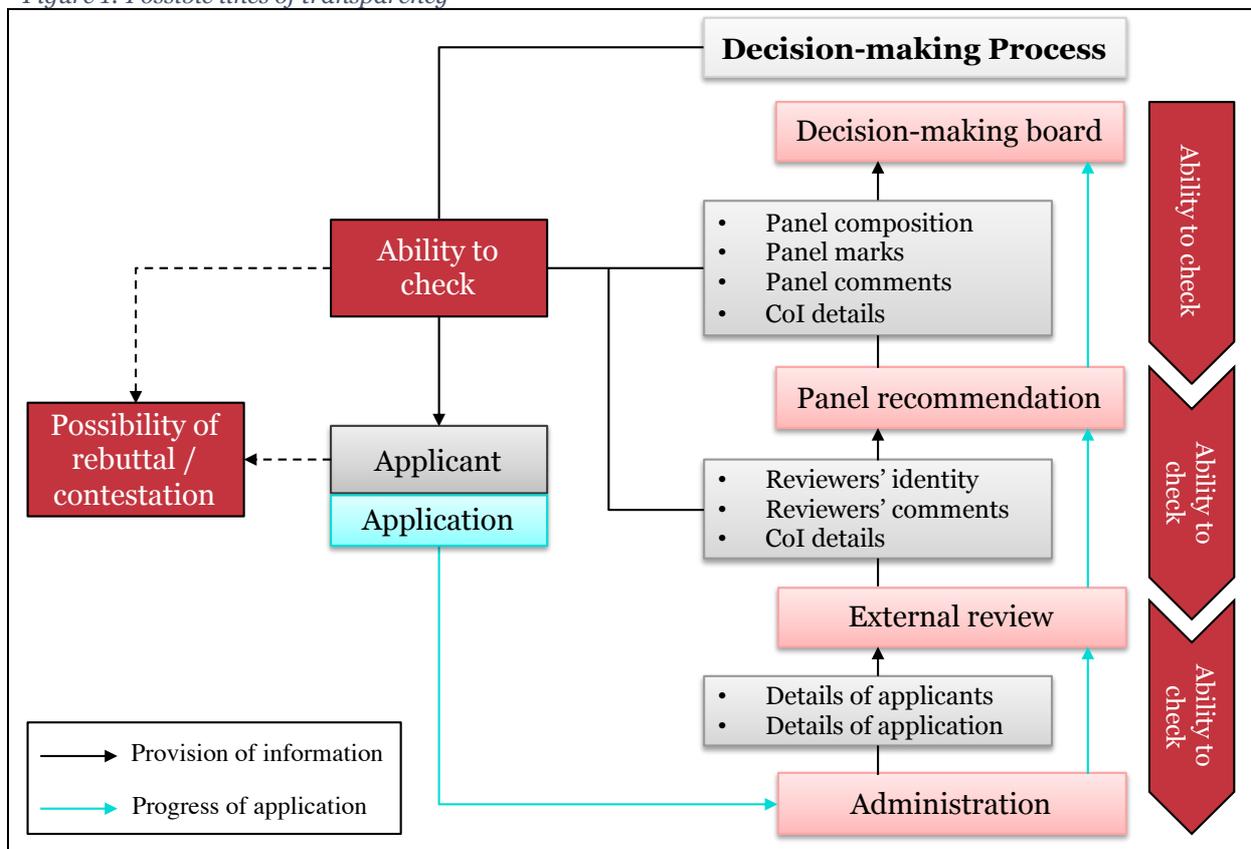
The quality of external referees' assessments for each individual proposal are checked by the selection committees. Board members have access to all relevant information such as research proposals, referees' reports, applicants' rebuttals, the description of the assessment procedure, the composition of the committee, and the assessment of the conflict of interest code. The board then takes a funding decision if it deems all procedures and conclusions to be sound. If not, it may deviate from the selection committee's advice, in which case it will state its reasons for doing so.

All materials on the basis of which decisions are made i.e. proposals, referees' reports and applicants' rebuttals are made available to the boards in addition to selection committees funding recommendations. In addition, boards also have access to information on how the assessment procedures and conflict of interest code have been followed, as well as on the composition of the committee.

Some funders also make information available to the applicants. A final grade and basic feedback to accompany a funding decision is to be expected in all cases. Panellists' names are usually available ex post and sometimes ex ante. However, In the case of NWO this also entails the possibility for applicants to rebut reviewers' comments (rebuttals can inform the funding decision). RCN (Norway) also goes beyond a minimum information provision, by allowing applicants to know reviewers' identities.

These various approaches ensure that no part of the funding process occurs without the possibility of conducting a check, either by the applicant or, more commonly, in the subsequent stage of the process itself. We visualise below the various lines of information transparency that exist across the comparator funders.

Figure 1: Possible lines of transparency



3.2 Spot-checking

The existence of the lines of transparency outlined above goes some way to prevent malpractice and to provide a degree of legitimacy to the process outcomes. However, the fact that data are made available and information on each funding stage is properly recorded does not necessarily ensure that anyone will actually make use of this information and check the process quality.

Most funders simply ensure transparency of information and then give responsibility for checking everything for quality and correctness to the individuals involved in the review process. As noted above, in the case of NWO there is even a ‘staggered’ set of responsibilities, where selection committees check the reviewer selection and review quality, whilst the board checks the committee’s reports and composition.

The SNSF (Switzerland) goes one step further. The SNSF’s Foundation Council (the highest academic board of the organisation) elects a ‘Compliance Committee’, a group of five members (currently four ‘Profs’ and one ‘Dr’), tasked with assuring the quality of funding decisions:

The Compliance Committee supports the Executive Committee of the Foundation Council in its supervisory function with regard to the scientific activities of the SNSF. In addition, it supports the National Research Council, the Presiding Board of the National Research Council and the Administrative Offices in guaranteeing the quality and legitimacy of the funding decisions for which these bodies are themselves responsible within the scope of their competencies and tasks.²

This committee meets twice a year and provides an annual report to the board. The statutes for the compliance committee state that it is not to assume or execute any line functions, though advisory tasks (for instance around process optimisation) are permissible. Reporting to the board, this committee is perhaps the closest analogue we find to the role of the SG at Formas. However, its role is much more clearly delineated as a quality assurance body. It is able to access all information on funding decisions and processes and thus can spot-check whether processes have been followed correctly.

3.3 Three approaches

We can therefore identify three approaches to process assurance, which we term ‘hierarchical’, ‘public’ and ‘external’ assurance. All three pre-suppose that information on each funding decision is systematically collected and made available in various arenas. These three approaches do not preclude each other: it is possible for a funder to use all three mechanisms.

- Hierarchical assurance: all information (e.g. on reviewer selection, comments, panel discussion minutes, etc) from each stage of the funding process is made available to the next stage of the process, so that panels can check quality and legitimacy of reviewer selection and review content, and decision boards check the panel composition and panel decisions
- Public assurance: all information on the process is made available to the applicant, offering the chance for rebuttal or contestation
- External assurance: all information on the process is made available to a specially tasked committee, which may conduct spot-checks, and flag up any systemic weaknesses they may find

We regard the Formas/Forte model with a secretary-general as a hybrid of the hierarchical and external models: the SG is part of the process, but also a specifically designated quality-assurer.

² Regulations for the compliance committee, including full description of remit: http://www.snf.ch/SiteCollectionDocuments/snf-compliance-ausschuss_E.pdf

Figure 2: Models of process quality assurance

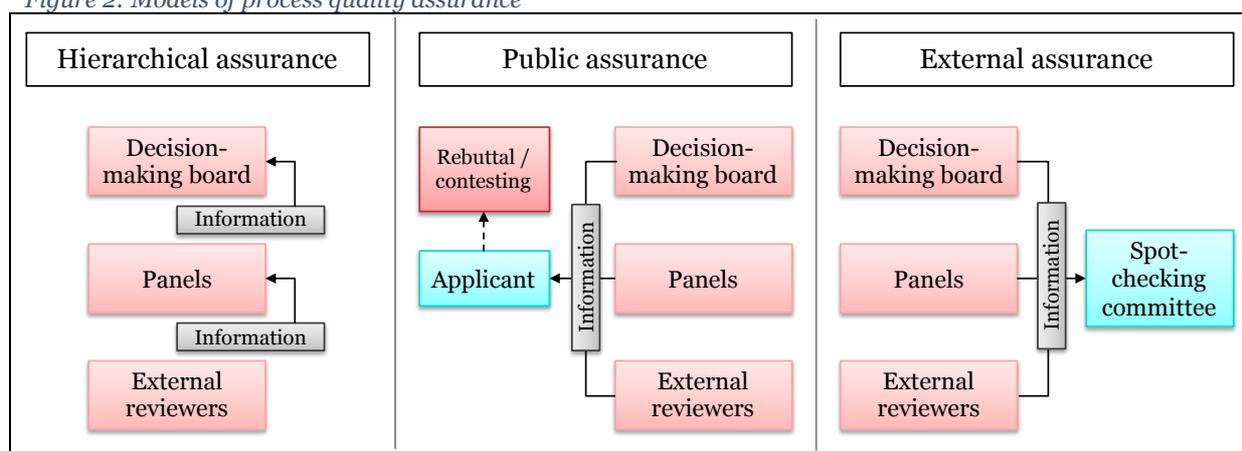


Table 3 shows the methods of assurance used in the funders studied. The degree of external transparency (public assurance) provided varies among funders.

Table 3: Process assurance

Organisation	Hierarchical assurance	Public assurance	External assurance
Formas	No	Yes	Secretary-general
Swedish Research Council	No	Yes	Secretary-general
Forte	No	Yes	Secretary-general
Vinnova	No	Yes	No
Swedish Energy Agency	Yes	Yes	No
Strategic Research Foundation	No	Yes	No
Research Council of Norway	Yes	Yes	No
Academy of Finland	Yes	Yes	No
Natural Environment Research Council	Yes	Yes	No
Netherlands Organisation for Scientific Research	Yes	Yes	No
Swiss National Science Foundation	Yes	Yes	Compliance Commission

3.4 A note on reviewer selection

One aspect of the scientific review and assessment process worth noting specifically is that of external reviewer selection. Whilst all other aspects of the funding process principally involve academics (reviewers, panel members and, at least in part, board members), reviewer and panellist selection is an aspect where administrators tend to play a major role. This applies foremost to the selection of external reviewers for individual applications, but also to the selection of panellists for funding schemes, calls or programmes.

The selection of reviewers and panel members is quality-assured through the transparency processes noted above. Across our comparator funders, there is generally a high level of trust in administrators' capacity to identify reviewers and panellists. This owes chiefly to the fact that administrators tend to have 'institutional experience' of research funder administrations as a whole, in addition to typically quite strong academic credentials: many have PhDs and at least some research experience (as is the case in Formas). Further, we note the following points about reviewer and panellist selection.

- In some cases, administrators (e.g. programme managers) find external reviewers and panellists completely independently. In others, they collaborate with members of existing panels or boards
 - The SNSF for instance has a ‘referee’ system, where each application is assigned to a research council member. This ‘referee’ will ultimately be responsible for collating external reviews and making a recommendation, but will also collaborate with an administrator to identify external reviewers. In some cases, administrators will do the search themselves and ask the referee to authorise the reviewer selection, but the ‘referee’ may also make their own suggestions
- Administrators make considerable use of support tools when identifying reviewers, such as Scopus, Google scholar, Web of Science and funder-internal databases of reviewers used previously for similar applications
- Some of the most modern application management IT systems are also moving towards automated reviewer identification. The Australian ARC’s system (launched in 2014) is able to identify possible reviewers based on matching key words and word-clouds of an application with those of all past applications submitted to the funder and match reviewers accordingly, whilst also automatically scanning for conflicts of interest
- Most funders take a completely open approach to finding reviewers, i.e. any researcher in the world could potentially be identified and asked for review if they are a ‘good fit’ to an application or panel. Others (e.g. NERC, UK) also have a ‘peer review college’, a list of thousands of certified people, from which reviewers and panellists are selected. This makes contacting the reviewers easier (because they know they are in the college) and also means that any selected reviewer will already have been subject to a basic check. This may also help increase the proportion of reviewers contacted who then actually agree to conduct a review

4 Criteria balancing

If the sole remit of a research funder is to fund bottom-up research for university-based researchers, then the processes outlined in the previous section are sufficient to ensure scientific quality and legitimacy. However, increasingly the process of proposal review is not free-standing; research funders have a thematic remit, have to respond to non-scientific policy imperatives and also to make major strategic investments. Hence, scientific assessment often takes place within these wider conditions.

In this section we describe what kind of scientific management is necessary to ensure that funders can accomplish their extra-scientific obligations (upon which their government funding depends), whilst ensuring the integrity of the scientific assessment process. The tools and structures that are used in this dimension of scientific management are very different from those discussed in the previous section.

4.1 An exception: ‘response mode’ funding

Whilst all research funders we have considered have at least some industry-relevant or thematic programmes, infrastructure investments and so on, most also have a stream of funding that is intended chiefly for ‘basic’ research, mostly in the form of standard project grants.³ This is variously referred to as ‘response mode’, ‘blue-skies’, ‘curiosity-driven’, ‘PI-initiated’ or ‘unsolicited’ research. It is worth briefly reflecting on this particular aspect of funders’ activities, because response mode funding is often structurally shielded from wider non-academic considerations. This is usually accomplished by having different decision-making processes for response mode and other types of funding.

Many funders are split into ‘departments’ or ‘divisions’, which correspond to disciplinary or thematic areas. These may have a divisional board or ‘council’ composed of senior academics (and occasionally a small number of non-academics or academics who work in professional circles) whose work falls within the division’s subject remit. Decision-making power about response-mode research is often given to these divisional boards. Higher-level strategic decisions, e.g. about creating cross-divisional programmes, large centres and strategic investments are typically taken at the higher level of the board of the funding organisation as a whole. Thematic programmes, where scientific quality needs to be considered alongside other criteria, are administered separately from response-mode ones, sometimes within and sometimes alongside the departments.

This is done in various ways, though all are relatively similar. The SNSF and NWO provide helpful examples here. NWO has four main domains, each with a domain board. These have decision-making power over basic research funding within their disciplinary remit and are composed largely of senior academics. The executive board, consisting of a broader range of different stakeholders and partially appointed by the Ministry takes programming decisions. However, separate programme boards (in some cases also so-called ‘task forces’) are then created by the division boards to actually run the programme and take funding decisions within it.

The SNSF has three discipline-based divisions, with have decision-making power over basic research through their respective research councils. There is also a fourth division called ‘programmes’, responsible for administration and funding beyond basic research. Higher level strategic decisions (e.g. what kind of programmes to run) are made by the Foundation Council. RCN has separate divisions for (response-mode) science, thematic programmes with societal goals, and innovation. Vinnova and the Swedish Energy Agency are thematically organised and do not have departments for response-mode funding.

The NWO system appears to take an ‘ad-hoc’ approach, with cross-domain creation of programme boards, whilst in the SNSF Division 4 provides more of a natural ‘home’ for activities other than basic research. Our research does not identify any known problems with either system. Both systems ensure that the assessment and funding process for ‘response mode’ basic research is ring-fenced from other

³ This may also pertain to research fellowships, travel grants, small equipment grants and other tools. The key point here is that we are talking about award types that have excellent research as their only criterion. Project grants for basic research are the ‘classic’ example and form by far the largest part of this type of funding for all funders considered here.

considerations pertinent to the funder’s mission, while arenas are created in which scientific criteria are balanced against other considerations.

Figure 3: Decision-making for response mode funding vs other types of decision-making at NWO

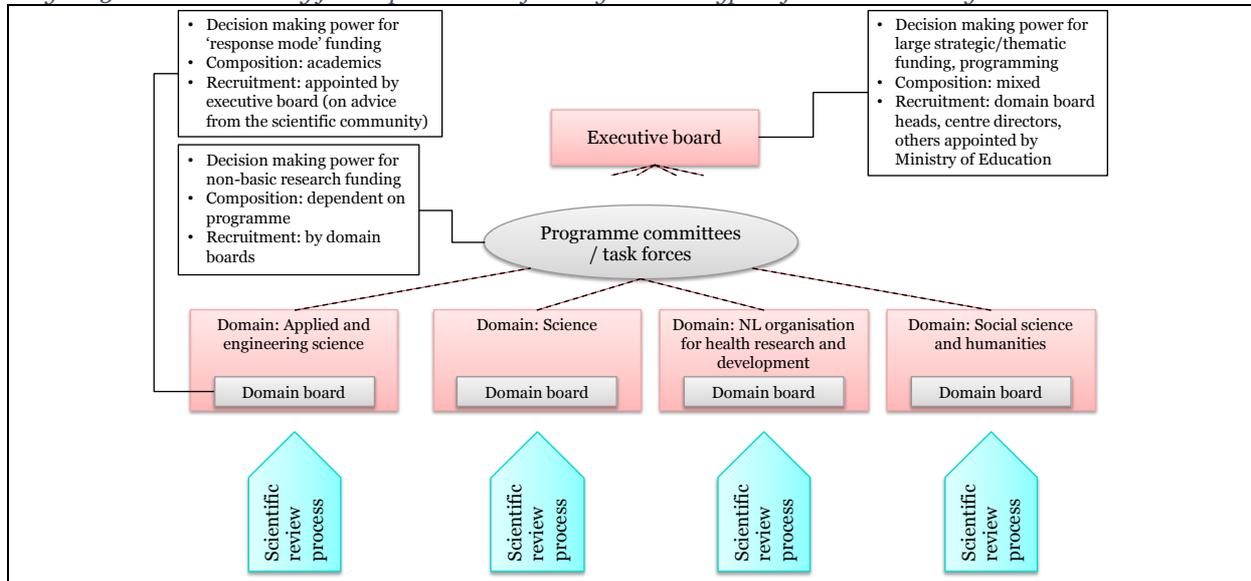
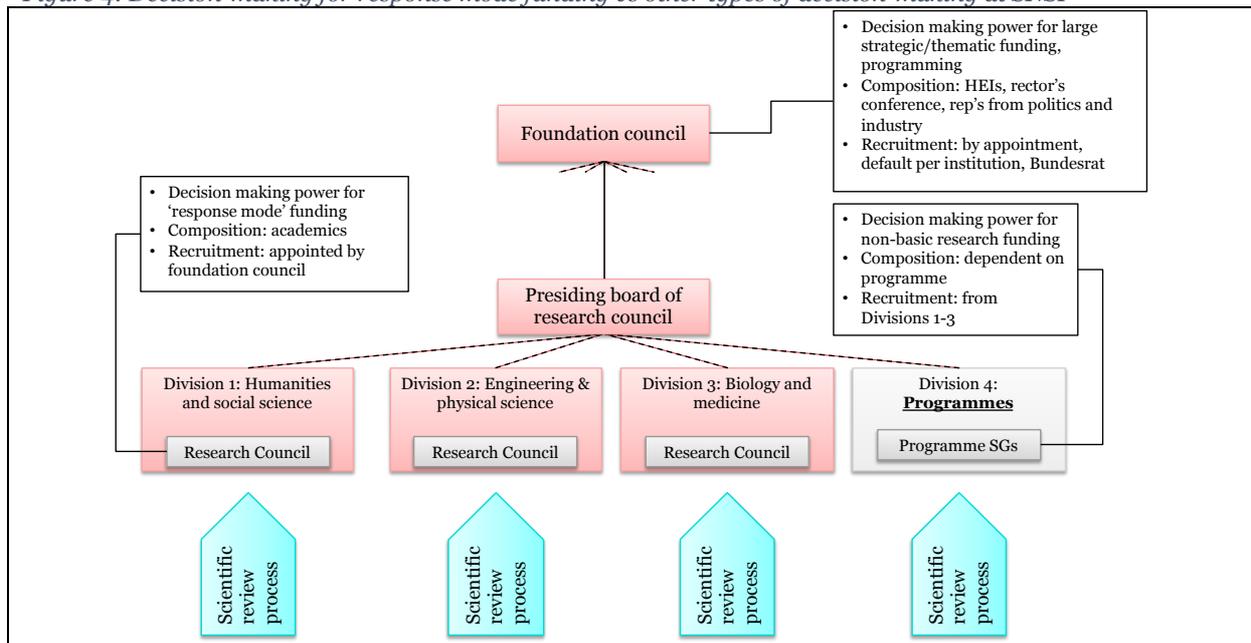


Figure 4: Decision-making for response mode funding vs other types of decision-making at SNSF



4.2 Balancing criteria at the proposal-level

In the case of ‘response mode’ research funding, funders tend to ensure that non-academic considerations are largely kept at a distance (though thematic relevance and consideration of non-academic impact may feature as an eligibility check). In this area, the processes presented in the previous main section of this report are sufficient to ensure scientific legitimacy and quality. We now turn to what happens outside of this particular area, so in thematic programmes, or industry-oriented funding tools. Here, we consider how decisions are made within such programmes, i.e. for individual proposals outside of ‘response mode’. The next sub-section will consider scientific quality and legitimacy dimensions in how such programmes are agreed upon and designed in the first place.

We find an array of different approaches here, even within individual funding organisations, but there are effectively two distinct approaches for balancing scientific and other criteria at the proposal assessment level.

In some cases, scientific excellence and other criteria (e.g. thematic relevance, potential for industrial use and impact) are all assessed together. In other words, a panel or reviewer (or both) on a non 'response mode' funding tool will be given a proposal, and asked to assess scientific quality and, for example, industrial relevance and create a composite review and score. All proposals in the call will be ranked accordingly and the 'top' proposals will be funded. The process is, essentially, exactly the same as traditional scientific review; only the criteria have been altered. Panels may consist only of researchers or comprise a mix of researchers and representatives of other societal interests.

In other cases, criteria are staggered. There may be a two-stage assessment process, where the first is only about assessing scientific quality, and the second about assessing societal relevance. The scientific assessment stage tends to be the process also used for response-mode research, with the same criteria and often the same types of reviewers (i.e. senior academics who are scientific experts in the field of the proposal). The assessment of industrial relevance may look similar, but may also take a very different shape (for instance an in-person interview, a short proposal stage, a panel of industry representatives or venture capitalists). For a proposal to succeed, it must do well in both stages, and usually do well in the first in order to enter the second.

The first of these two scenarios is probably practised more often, simply because it mimics most closely the established process of scientific review. However, it is not without problems. Firstly, it can be seen as diluting scientific quality: if scientific and non-scientific criteria are to be balanced against each other so directly, then reviewers are no longer free to reward the highest scientific standards. There is a risk that a proposal may be of questionable scientific quality, but may still get funded based on its industrial relevance. This is a commonly-voiced concern with such multi-criteria funding from the perspective of academics.

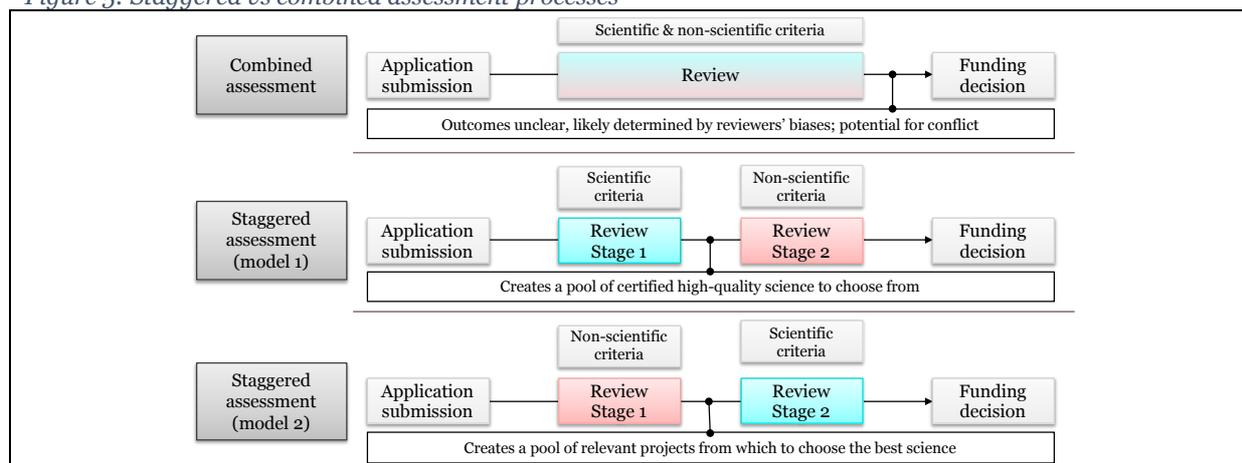
Secondly, it is unclear whether such an approach of simply combining scientific and non-scientific criteria in a single review procedure actually produces satisfactory outcomes: if reviewers in such a process are predominantly academics, they will emphasise scientific criteria in their judgement, and vice versa. How exactly different criteria are weighed up against each other is in effect up to the reviewers, whose biases may well shape the funding outcomes.⁴

Staggered approaches allow the scientific review process to exist un-inhibited by other considerations. Additional stages help to provide direction, and inclusion of non-academic reviewers/panellists is often helpful here. Staggered assessment approaches can be sequenced in different ways. The first is more prevalent among the funders we studied.

- It can begin with scientific assessment, resulting in a pool of high-quality science for thematic experts to choose from, for example in a final decision-making body composed of people with 'user' as well as research experience
- It can also begin with a non-scientific assessment (for example an 'expression of interest' phase of short proposals focussing on industrial relevance and reviewed by a non-academic panel), with all successful projects then subject to full scientific review, so that proposals irrelevant to the non-scientific aims of the programme are filtered out, but the best science still gets funded. An additional benefit of this approach is that fewer proposals go to scientific review in the first place: the increasing 'peer review burden' on researchers is a problem encountered in most countries, and methods to lessen the amount of necessary scientific peer reviewing is almost always strongly welcomed.

⁴ A recent evaluation showed this to be the case with the 'use-inspired basic research' stream at the SNSF: the non-academic 'use' potential of applications was to be considered alongside scientific quality, but was in fact rarely considered or rewarded by predominantly academic reviewers. See Kolarz P, Arnold E & Farla K (2017) Use-inspired basic research at SNSF. Technopolis: http://www.snf.ch/SiteCollectionDocuments/SNSF_UIBR_Final_Report_by_Technopolis_May2017.pdf

Figure 5: Staggered vs combined assessment processes



For ‘response mode’ funding, as well as for funding under some thematic programmes, the funders we have considered here use a system of assessment panels usually consisting mostly of senior academics, with a small number of industry or user representatives sometimes involved (but almost never in the majority). These panels are often aided by reviews from external reviewers, who are likewise almost always academics.

However, many funders also have alternative assessment procedures for particular programmes and award types. Table 4 shows examples of these, though we note that this list may not be exhaustive (especially when we consider the possibility of past programmes that have ended or possible future programmes still under discussion).⁵

Table 4: Examples of alternative funding processes

Funder	Programme	Process description
Forte	For project grants and junior researcher grants:	For project grants and junior researcher grants: two stages. In stage 1, researchers submit a project outline to Forte. When the call closes, Forte’s review panels decide which project outlines will be accepted for stage 2. In stage 2 of the application process, researchers are given the opportunity to submit a full application.
NERC	Small investments - various	Small investments and outline proposals are panel-assessed only and proposals assessed during ‘sandpits’ are peer reviewed in real-time.
NWO	Various – depending on expected proposal volume	Pre-proposals may be requested if NWO expects a high volume of proposals for a particular call relative to the budget available. In these cases, a full application will be accepted only if the pre-proposal has been successful.
SNF	National research programmes	Two-stage process: short proposals for stage 1, followed by full proposal.
Academy of Finland	Academy Programmes (selected calls)	A two-stage call includes a pre-proposal stage where proposals are checked against eligibility criteria or may even go through an initial peer review. Applicants whose proposals make it through the pre-proposal stage will be invited to submit a full proposal.
RCN	Various (incl. research infrastructures)	Grant applications are normally reviewed by external referees (individually or in panel), whose judgements are passed on to the programme board (or equivalent), which rates and ranks proposals and proposes which should be funded, in accordance with the assessment criteria specified for the relevant application type and/or in the call for proposals.

⁵ We are aware of several further schemes of other funders that use multi-stage assessment processes in various forms, including: the Sir Henry Wellcome Commemorative Awards for Innovative Research (Wellcome Trust, UK), Discovery Frontiers (NSERC, Canada), the IDEAS fund (EPSRC, UK), the Transformative Research scheme (ESRC, UK), Industry Fellowships (Royal Society, UK).

4.3 Balancing criteria at the programming level

Weighing up academic and non-academic considerations is also done at the higher level of funding organisations, where decisions are taken that affect the funder’s ability to carry out its societal missions. This includes decisions on what kind of special programmes to run or what centres and facilities to build.

We note that in some cases, government is quite prescriptive in terms of the thematic content of a programme, whereas other funders have more decision power themselves in these matters. Even in the former case, there are still decisions to be made on programme design, e.g. on the amount of basic research vs applied or collaborative research funding within a given programme. More generally, budgetary decisions (i.e. where does the money go and for what types of research exactly) are made here.

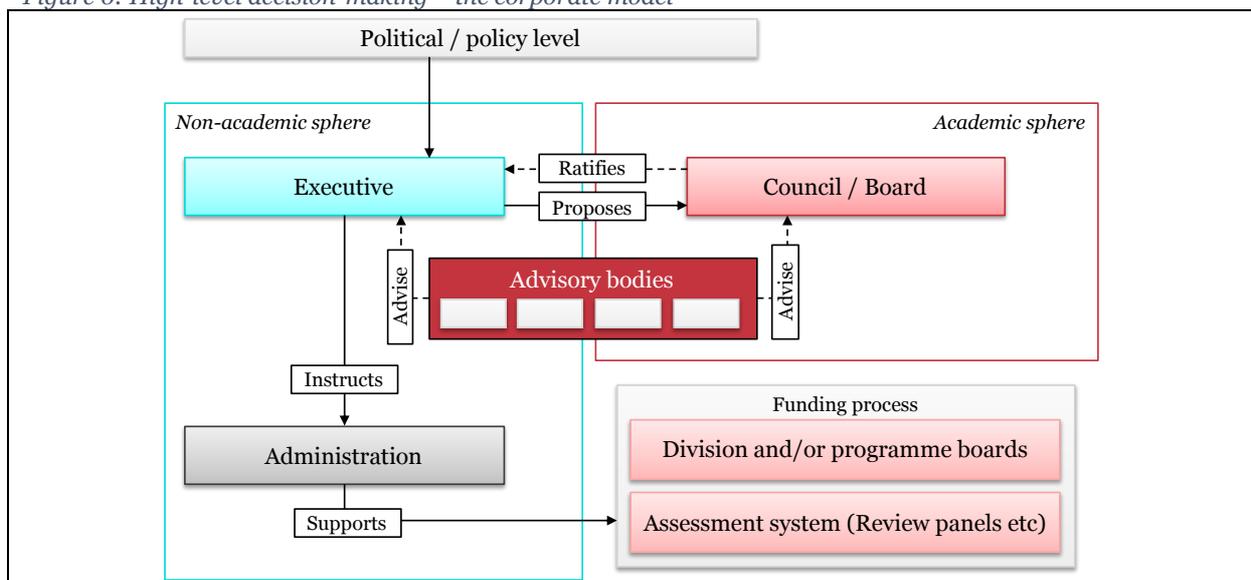
All funders we have considered have a high-level board (sometimes referred to as a ‘council’). Methods of board recruitment vary. Some involve an application procedure, though at least some positions are typically appointed by the government, or occur by default, specifically for directors of major research facilities owned by the funder, or heads of university rectors’ associations. Sweden is unique among the countries considered in having elected representatives of the research community in the governance of research funders while Switzerland’s SNSF is governed by academic representatives. This raises important principal/agent issues.

These boards play an important role in high-level decision making, where academic and non-academic considerations need to be weighed up. They are typically supported by a range of advisory groups on various issues related to research. Some of these may be of a scientific nature (e.g. research priorities, research ethics, open science, etc), others advise on non-academic matters (e.g. industry needs, equality & diversity, risk & audit, capital investment, etc).

However, there are at least two distinct ways in which these boards operate. We define the two approaches respectively as the ‘corporate’ and the ‘consensus’ models. The consensus model is emergent and not yet as firmly established as the corporate one.

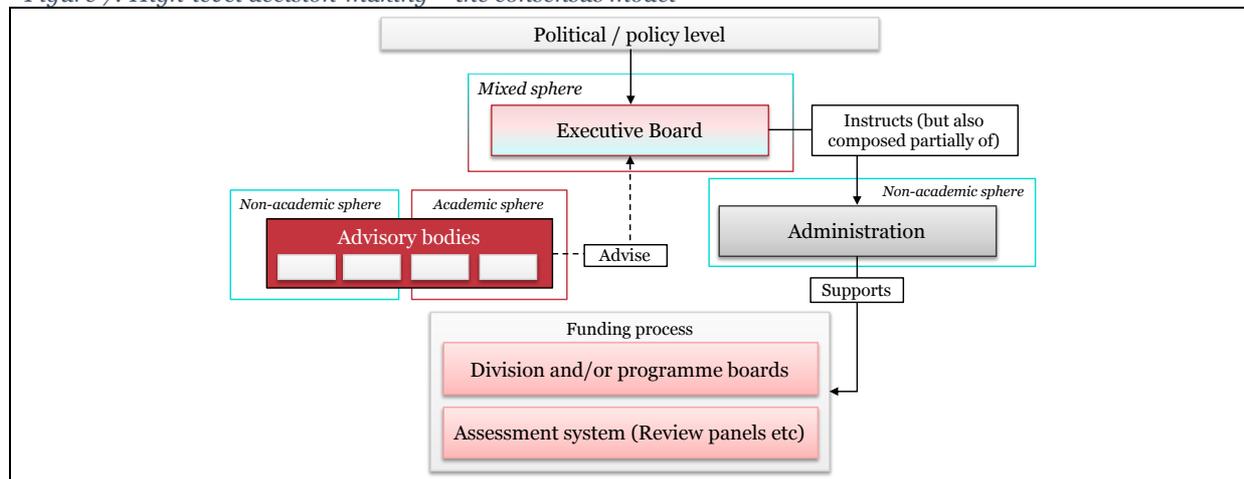
In the corporate model, there is a clear distinction between the council and the executive, which is effectively the top-level of the administration of the research funder. Individuals with significant research experience may work for the executive (as was the case in NERC’s old system), but the executive is the main communication channel to the policy level and thus represents non-academic considerations at least in part. The executive formulates programmes, whilst the council ratifies and may suggest amendments. Both have the support of advisory boards in the process.

Figure 6: High-level decision-making – the corporate model



In the second model, this separation does not exist in the same way. Some funders instead have an ‘executive board’. This tends to be more evenly composed of academics and non-academics, while academics often also have managerial remit over a research centre or infrastructure (in other words, few if any members will be on such a board purely due to their excellent research credentials). Senior administrators are also represented here in some cases. The executive board is once again supported by advisory groups, and has decision making power.

Figure 7: High-level decision-making – the consensus model



It is immediately clear that the first of these two models is built on an assumption of a potentially adversarial relationship between an academic ratifying council and a policy-oriented executive, whilst the second assumes that consensus within a mixed group can be reached.

To an extent these different models may reflect cultural preferences. However, we note that both NERC (UK) and NWO (NL) have recently been restructured into having an executive board of this type, suggesting perhaps an international trend away from adversarial relationships between academic and non-academic standpoints in the decision-making at research funding councils.

In both models, the attributes and persuasion-power of the individuals involved is of course a factor that influences outcomes, regardless of the structure in which they operate.⁶ In this sense, our research does not allow us to identify whether academics or non-academics necessarily hold more power in either model. However, the consensus model creates a board that is directly answerable to both the policy level and the researcher base at the same time, which means that it is in the board’s interest to reach decisions that satisfy both. In the corporate model, council and executive are effectively answerable to different constituencies (the executive representing policy interests, the council representing academic interests), which may risk longer and more drawn out disagreements in the absence of common accountability.

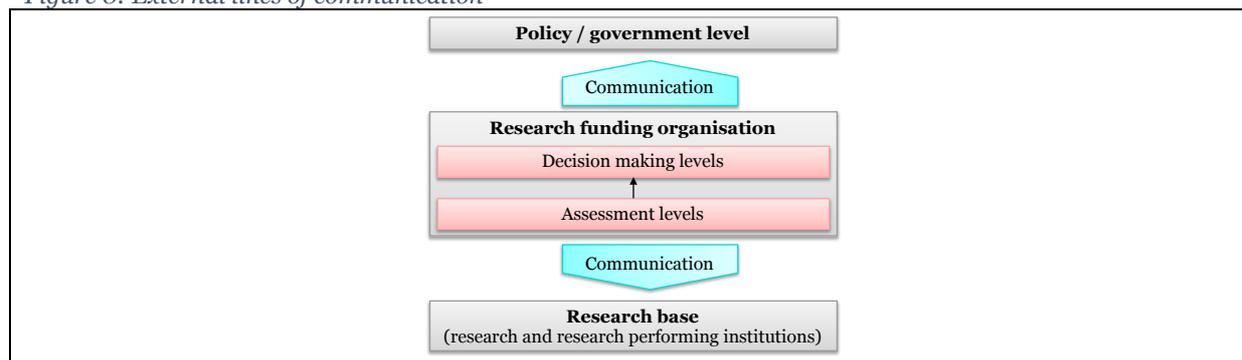
We note that Formas approximates more closely to the corporate model than to the consensus model, with the added factor of the secretary-general (SG) position to oversee and quality-assure decisions. This ‘version’ of the corporate model is found in only one other funder we have considered, namely Forte (SE). VR has five SGs, each attached to a disciplinary council, but focused solely on issues of scientific quality rather than addressing the tension between relevance and scientific excellence. Whilst we are aware that some SGs at Formas and Forte choose to also quality-assure higher-level programming decisions, other funders do not appear to have such a function. Advisory boards provide input to help executive and council (or the executive board) to reach an optimal decision, but an additional scientific quality check in the form found at Formas and Forte does not appear to exist elsewhere.

⁶ A review of the old NERC council (approximating to the ‘corporate model’ at the time) found that this was an important factor behind the power relations between council and executive. The recommendations of the review are in the public domain: <https://nerc.ukri.org/about/perform/evaluation/evaluationreports/council-review-summary/>

4.4 Communication between policy and the research base

As a final point, it is important to consider the importance of communication beyond the research funding organisation itself, as there is a degree of scientific management to be conducted here too. No matter how exactly programming decisions are made, there is still the potential for communication breakdown between the policy-level and the research base. In other words, programmes may be mandated ‘from above’ that do not match a country’s research strengths or trajectories. Alternatively, parts of the research base may have such limited knowledge of the policy imperatives that drive at least some parts of science funding that they may not be optimally responsive to programmes when they do get launched. A research funder’s communication efforts – in both directions – are important here.

Figure 8: External lines of communication



Several funders we have considered here ensure they communicate with their research base (individual researchers and/or university rectors) through regular events or consultations.⁷ However, there are also instances of ‘upward’ communication to the policy level.

In addition to the normal internal discussions and analyses, NWO, the Academy of Finland and RCN are involved in external processes of consultation about future research priorities with the research community and wider society. NWO consults the academic community extensively outside the ‘bottom-up’ programmes. In the case of the one-third of its expenditure that is based on the national research strategy, the priorities are the result of a large-scale public consultation mediated by extensive discussion with the academic community. The Academy of Finland has moved from having a large number of thematic programmes, proposed by its constituent research councils, to having ten or so that result from consultation with the research community. RCN’s thematic priorities are increasingly governed by the national ‘Long Term Plan’ for research, which is periodically set by the ministries, based on extensive consultation with the scientific community. The other driver of its thematic priorities is a continuous process of negotiation with the 15 ministries that provide it with funding, where RCN particularly focuses on finding points of commonality and aims to design programmes attractive to more than one ministry.

A further example worth noting here is NERC. In its newly formed Executive Council, it has one member who is the ‘Chief Scientific Advisor representative’. The post is currently held by the chief scientific advisor to the UK Department for Environment, Food and Rural Affairs. Experienced in both the academic and policy spheres, this position acts as a ‘go-between’, regularly in discussion with both the policy level and research circles, including the academic boards of NERC itself. The Chief Scientific Advisor representative does not have decision-making power, but can liaise between policy and the research funding worlds to create mutual understanding, persuade and help broker compromises where needed.

⁷ ANR in France has recently also undertaken ‘road tours’ to visits universities around the country and hear about emerging research strengths and strategies and communicate likely future research agendas.

5 Conclusion

The task of ensuring scientific quality and legitimacy falls into two distinct parts.

- Ensuring that the process of scientific review is operating properly, to a high standard and without problems or conflicts of interest
- Ensuring that scientific quality and excellence are not diluted or compromised by other considerations to do with the societal and political missions of the funding organisation.

All comparator funders we have considered here have structures and processes in place to cover these two dimensions of ‘scientific management’, but most often there are different structures in place to address these two dimensions.

Scientific peer review is universally acknowledged as the main legitimacy-granting feature of a research funder’s operations. Applicants (and the academic world more generally) trust the peer review system. There is, however, a difficulty in the fact that many see the scientific community as over-burdened by increased peer review requirements. Ways to limit or simplify peer review are much sought-after.

Transparency and availability of information about each peer review process (as well as subsequent panel discussions and decisions) is the main device that is used for quality-assuring the scientific review process. Information can variously be made available (automatically or on request) to different stages of the assessment process itself, to applicants, or to a specially appointed group or commission that may perform sporadic spot-checks and, over time, potentially identify any systemic problems in the scientific review process and suggest reforms.

Aside from these transparency features and standard rules and processes (often assisted by IT systems) to identify and avoid conflicts of interest, little else is felt to be needed to guarantee high-quality and legitimate outcomes from a pure scientific review process. Transparency and spot-checking tends to play the dominant role for international funders, whereas various oversight roles appear to have more significance in Sweden. In effect, this means that scientific legitimacy is achieved by inspection or ‘quality control’, rather than by building quality-assured processes. The emphasis on ‘quality control’ appears to signify a continuing lack of trust within the researcher-governed parts of the funding system, and also becomes challenging for larger funders with a broad remit, as the quality controller(s) must have very broad scientific expertise to control everything appropriately.

Those aspects of a funder’s activities that pertain only to bottom-up, basic research funding (‘response mode’ funding) are typically ring-fenced from wider strategic, thematic, societal or policy considerations: divisional or domain boards largely consisting of senior academics have the final decision-making power over such types of funding.

Every research funder we have considered considers it axiomatic that they do not fund scientifically sub-standard research. However, many activities of a research funder go beyond pure scientific reviewing with scientific ‘excellence’ as the sole criterion.⁸ This is chiefly the case in funding decisions where criteria besides scientific excellence are also present, and in decisions about what kind of programmes to design. In this second dimension of scientific management, the aim is not to ensure the error-free functioning of the scientific review process itself, but to ensure that the scientific review process can operate within a context of wider, non-academic criteria and considerations.

For individual funding decisions in programmes that have criteria besides scientific excellence, most funders most of the time still use a standard peer review and panel decision system very similar to standard basic research funding, where reviewers are simply instructed to include a wider set of criteria in their judgements. However, in this approach there is a danger that either scientific considerations (and quality) are ‘diluted’, or that additional, extra-scientific criteria are in fact not taken into account

⁸ We note that relevance to the funder’s disciplinary or thematic remit, as well as a degree of consideration of non-academic impact may still be required for ‘response mode’ funding, but these tend to simply be matters of eligibility, rather than matters to be scrutinised, ranked or critiqued in the assessment process.

(or only to a very limited extent). Funders generally struggle to articulate how exactly scientific and extra-scientific criteria are balanced in this scenario. Though structurally simple, it is, in short, open to criticism from all sides.

Multi-step assessment procedures offer a potential solution to this problem, so that scientific and extra-scientific criteria are checked at different stages of the assessment process (and often by different people). This takes many different forms (e.g. ‘expression of interest’ stages prior to a scientific review stage, or a user/industry panel following a scientific review stage), but most share the principle that a full and un-obstructed scientific review stage can take place, while non-academic considerations are made either before the review (so that all proposals entering scientific review have already been confirmed as fulfilling the extra-scientific criteria) or after the review (so that any proposal funded based on non-academic considerations has already been confirmed to be of high scientific quality).

Higher-level decisions about programming and budget allocations are not about process but about governance. The important question here is how, at the highest levels of a funding organisation, dialogue and decision-making structures can work in such a way that decisions ensure high-quality scientific work can take place, whilst also ensuring that the funder’s non-academic mission(s) can be fulfilled.

Funders broadly have one of two models. Either what we term a ‘corporate’ system, with an executive group heading the administration, who propose programmes and other high-level actions, and a largely academic-led council, who must ratify decisions and may propose amendments. Alternatively, funders have what we term a ‘consensus’ system, where an executive council, typically made up in more-or-less equal measure of policy and industry stakeholders, as well as high-level academics and research infrastructure or centre directors and senior administrative staff. This body arrives at decisions jointly. In both models, various advisory bodies provide input and advice to the council and the executive (or, in the consensus model, the executive council).

Based on the selection of funders we have considered, the trend seems to be towards the ‘consensus’ model, with both NERC and NWO transitioning to this in recent years. A tentative hypothesis to explain this trend is that there is an increasing awareness among policymakers, academics and others that scientific and extra-scientific considerations must both inform a research funder’s strategic decisions. In short: modern funders do not assume an adversarial relationship between academics and non-academics or, indeed, between academic committees and the administration in research funding organisations. Advisory groups to support scientific and extra-scientific considerations made by combined executive councils further support the ability to arrive at high-level decisions that satisfy all requirements.

Finally, it should be noted that a funder’s communication activities, both with the researcher base and with the policy-level are important in avoiding major communication breakdowns. Whether through individual ‘chief scientific advisor’ positions or regular ‘around the country’ events, funders increasingly play an important role in ensuring researchers know what the policy level wants and the policy level knows what the research base can do.

5.1 Options for the future of scientific management at Formas – process assurance

Every funder is different: size, remit and culture all matter, as does the ‘political’ feasibility of various possible changes. Rather than providing set recommendations, we instead outline here the various options that Formas might consider in updating its scientific management. As in this report, we divide into ‘process assurance’ and ‘criteria balancing’.

On process assurance, there is certainly a case for considering change: designating the SG’s role as the main guarantor of scientific quality of the assessment process is not practised anywhere in this form (other than at Forte), and contains certain hazards: with a single person in charge of quality assurance, there is a limit to how far the organisation can continue to grow – there is a finite amount of quality-control that one single human being is capable of performing. Secondly, any SG would need high scientific competence in all thematic and disciplinary areas covered by Formas. This appears no longer to be plausible, given Formas’ current scale and breadth.

One option to move forward would be to split the SG's role into several posts, for example one per thematic division at Formas (a system found also at VR, which has five SGs). In this way, SGs' expertise would no longer need to be as broad, and the burden of quality control would be spread over more people.

An alternative option is to bring Formas into line with international norms and transition from quality control to quality assurance. Fundamentally, this means that all information on office processing, reviewer selection, reviews, panel discussion, reports and decisions (including reasons) are well documented and available to be viewed at any subsequent stage within the assessment process, but that an actual 'check' is not performed by a separate entity (like the SG) in every case. With suitable levels of transparency of information within the funding process, any part of the assessment process could in theory be checked, which discourages poor practice.

In terms of process assurance, such a system reliant on transparency would make the role of an SG redundant. However, even in such a 'self-checking' system, there is the option of having a special unit responsible for quality assurance in the shape of 'spot checks'. This could be a new unit or committee within Formas, or a subset of Science Council members could be given this role. Members of the scientific community (outside of Formas itself) could likewise be recruited sporadically to do this. The task would involve reviewing a small subset of funding processes and decisions retrospectively (and preferably at random), to confirm that all processes are working well and, if applicable, to highlight to the organisation any systemic problems that might exist in the assessment processes. Creating such an additional quality-assurance team may signify a lack of trust, in the sense that a self-checking system might not be viewed as sufficient to guarantee high quality standards. However, it also signals a commitment to improving assessment processes in the longer term.

As an additional measure, Formas could consider whether the idea of a self-checking system could be expanded by making information on each proposal assessment public, i.e. where applicants or any interested parties could see who reviewed, discussed, assessed, ranked and funded each proposal and the reasons for each decision. There is a trade-off here: availability of information adds scientific legitimacy but also encourages greater levels of contestation of decisions by applicants. There may, more generally, be a case for Formas to review what information on each individual proposal assessment is currently shared within or beyond the organisation, and whether this is already sufficient for 'hierarchical' assurance within the funding process, and indeed for public assurance by the applicant(s) and wider research community.

Different award types may need different levels of process assurance, most notably when it comes to award size: large awards (e.g. centre/research infrastructure grants) might require more systematic quality assurance and several perspectives on whether the selection process was conducted optimally, even if this carries some additional administrative burden. For the smallest award types (e.g. travel or workshop grants) the consequences of occasionally 'getting things wrong' are much smaller, and so very light-touch process assurance will be enough and will help reduce administrative burden. There is therefore a case for Formas to appraise the full range of its award types and funding schemes, and check whether the size of the awards justifies currently practiced levels of process assurance in each award type's case.

Finally, there are some options to consider on the issue of reviewer selection. At most funders, members of the administration are largely responsible for this. Many administrators in charge of such tasks have PhDs (though this is not always deemed essential), and can most often draw on institutional experience and processes for working in research-funding contexts. High-level research experience is not everywhere felt to be important to perform this task – though some research experience (e.g. PhD) and field knowledge helps. From our findings, institutional experience codified into reliable processes is an important driver of the trust that most research funders have in their administrators' ability to identify reviewers for applications (especially, as noted, because transparency always means that appropriate selection can be checked).

To aid the quality assurance of reviewer selection, there are two further options. One is to move to a more automated system. The Australian ARC uses a custom-built system that can identify reviewers based on associations with previous application reviews that match key words from current ones (and also scan for conflicts of interest). Consulting with ARC about cost and experiences with such systems could further aid reviewer selection. Formas could also consider creating a peer review college, i.e. a database of reviewers who have consented to being 'on call' to perform reviews for Formas, containing some basic information about each reviewer (institution, track record, expertise, etc). This only goes some way to always ensuring thematic fit, but it means that a basic quality check of reviewers has already been undertaken, long before they are asked to review a specific application, and it is possible to keep data about individual reviewers' performance.

5.2 Options for the future of scientific management at Formas – criteria balancing

Like many other funders, the remit of Formas has grown in recent years. Besides funding scientifically excellent research, all programmes must also demonstrate societal relevance and at least some programmes must demonstrate inclusion of non-academic organisations, or pursue non-academic impact.

At the level of individual project decisions and of higher-level programming decisions (what kinds of programmes to fund and how they should be designed), there is a danger that scientific and extra-scientific considerations come into conflict, or that academic and non-academic assessment criteria are perceived to 'dilute' each other. There are various structural changes that Formas could consider to avoid conflict and ensure that a healthy scientific review process can take place un-hindered and that funded research is industry and policy-relevant.

For individual funding decisions, pragmatism is critical: though all of Formas' funding is supposed to be thematically relevant to Formas mission, some funding schemes may fundamentally have scientific excellence as the sole criterion. A brief initial check for thematic eligibility may suffice, before a fully science-based review occurs.

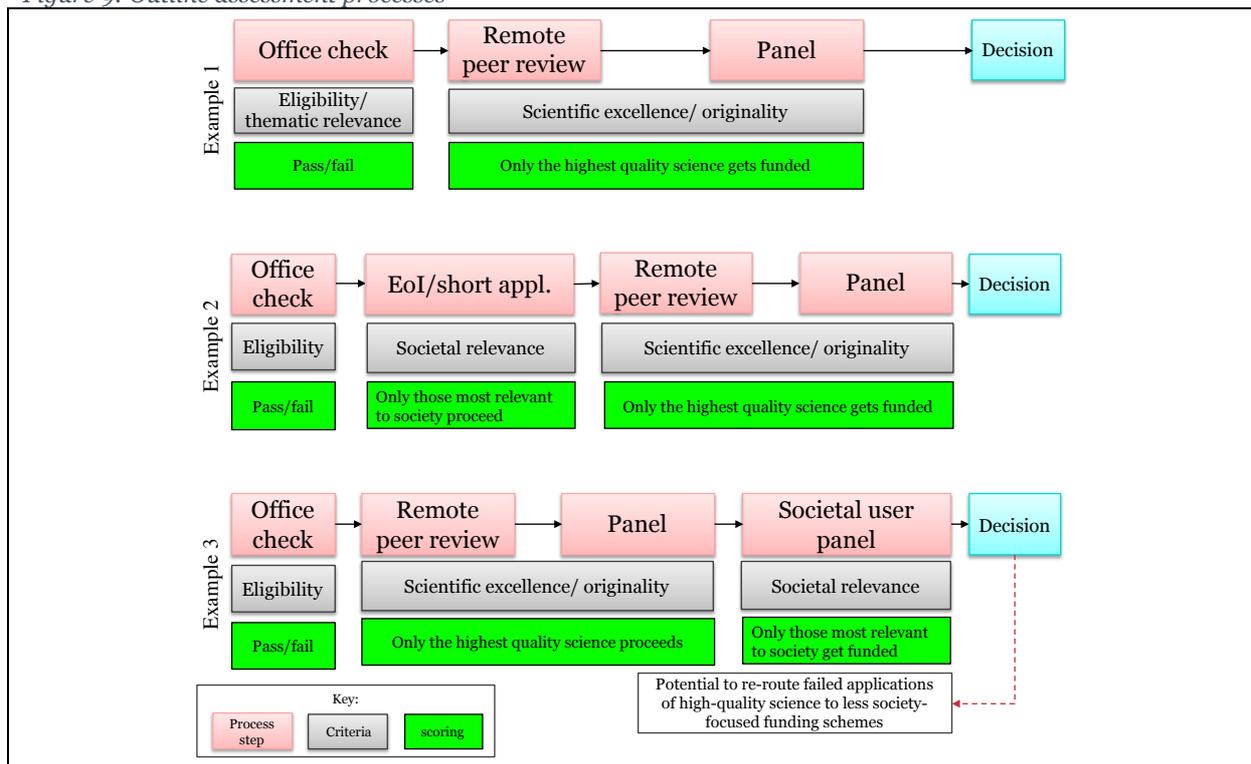
But in other funding schemes, societal relevance and collaboration need to be weighed alongside scientific considerations. It is in such cases that single-stage assessment processes can become challenging. When academic and non-academic assessors and scientific and extra-scientific considerations are all conflated within a single assessment step, there is a risk that the winning applications are seen to be either sub-standard science, or irrelevant science, depending on which group of assessors and criteria has the 'upper hand'.

To address this, Formas may consider implementing multi-stage assessment processes, where different criteria (and different types of assessors) come into play at different stages. Implementing 'Expression of Interest' (EoI) stages near the start of the assessment process where, for example, societal relevance can be assessed and non-relevant applications filtered out has the added benefit of reducing the burden of scientific review. If scientific review is placed earlier in the assessment process with societal relevance to be assessed subsequently, this efficiency saving is lost, but there is the possibility to identify scientifically excellent but less societally relevant programmes and 're-direct' these to funding streams where societal relevance has less weight in the criteria.⁹

Multi-step assessment processes are becoming more usual internationally, especially for funding schemes where criteria other than scientific excellence have high prominence. Figure 9 illustrates options.

⁹ RCN is currently synchronising its response-mode and thematic calls in order to make it possible to move high-quality proposals between these categories. The main reason is to increase the response-mode success rate by moving relevant projects into thematic programmes.

Figure 9: Outline assessment processes



At the higher level of strategic and programming decisions, there are likewise various options to consider. At present, decisions at Formas are taken between the administration, who effectively represent the policy level, and the science council, which represents the scientific community, with the SG sometimes exercising support or oversight of programme creation. Whilst such council/executive systems are not uncommon, a single person such as the Formas SG having involvement in such processes is unique to Formas and Forte among the funders we have considered here. As with ‘process assurance’, here too there is a case to consider whether any individual has either the time (given organisational growth) or the breadth of expertise to exercise either an advisory or a supervisory function.

Other funders tend to rely on a mixture of advisory bodies and ad hoc consultations. Scientific advisory bodies representing the full disciplinary range covered by the funding organisation can assess whether the scientific community is well-equipped to provide the research sought, and whether the aims of the programme lend themselves to conducting high-quality research at all. Industry and societal advisory bodies can do the same for societal relevance. Ad hoc groups can be created for risk assessment, research ethics, open access – any aspect, in short, on which input is habitually required for major, strategic decisions. In the presence of suitable advisory bodies, administration and council no longer need to rely on their own expertise, but are tasked with weighing up the advice provided to them by the respective groups.

Formas may review what kinds of advisory functions already exist within the organisation, and consider whether any additional advisory boards or committee are required. A suitable range of advisory functions would be able to strengthen the decision-making process through more diverse expertise than any single SG (or the membership of any science council or administration on its own) is able to provide.

Finally, there could also be a case to introduce more than one decision-making level at Formas, with each of the three current departments having its own academic committee. This is common among many funders, but the relatively small size of Formas means such an arrangement would tend to be inefficient. Should Formas’ rate of growth continue, this may nevertheless be a helpful step to ensure the higher levels of the organisation do not become overburdened, as the number of funding tools and application calls grows.

Appendix A Methodological note

For each of the ten comparator funders, we conducted an extensive desk research phase. Most funders have a detailed overview of their decision-making processes in the public domain, typically including an organigram, as well as rules governing appointment and oversight of the individuals and groups involved in the decision-making process. Such material was accessed for each funder in order to develop a structural understanding of how each one deals with the headline questions for this study. This initial analysis resulted in short write-ups for each funder, including the funders' own organigrams where available, or our own visualisations where they are not.

In some cases, there are published evaluations or reviews of funders' assessment systems. None of these directly address all areas of interest to Formas for this study, but we additionally considered these in our desk research phase where available.

Desk research ensured a full structural understanding of funders, but these documents do not answer more qualitative dimensions of the legitimacy-granting aspects of each organisation. To complete the picture and moving from description of structure (covered by desk research) to the qualitative and evaluative aspect of strengths and weaknesses, we further conducted a programme of interviews covering each of the ten comparator organisations. We present details of interviews and interview questions in the sections below.

The funder templates generated for this study result from our desk research and interviews phase, and further conclusions drawn in this report are extracted from the comparative analysis of this information.

A.1 Interviewees:

Figure 10: List of interviewees and interview details

Organisation	Interviewee type	Name	Position	Interview date	Interviewer
Swedish Research Council (SE)	<i>Administrative</i>	Maria Thuvesson & Lucas Pettersson	Head of the Department of Research Funding & Head of Analysis and Evaluation	29-08-2018	Helen Andreasson
	<i>Academic</i>	Kerstin Sahlin	Departmental SG	21-08-2018	Erik Arnold
		Jan Nilsson	Vice Chair	10-09-2018	Erik Arnold
Forte (SE)	<i>Administrative</i>	Dag Hervieu, Lars Wårngård	D-G	30-08-2018	Helen Andreasson
	<i>Academic</i>	Lena Abrahamsson	Board member	07-09-2018	Erik Arnold
Vinnova (SE)	<i>Administrative</i>	Joakim Tiseus	Department of Operational Development	05-09-2018	Helen Andreasson
	<i>Academic</i>	Anna Nilsson Ehle	Chair of the board	17-09-2018	Erik Arnold
Swedish Energy Agency (SE)	<i>Administrative</i>	Rémy Kolessar	Head of the Research and Innovation department	31-08-2018	Helen Andreasson
	<i>Academic</i>	Lena Neij	Member of EUN	10-09-2018	Erik Arnold
Strategic Research Foundation (SE)	<i>Administrative</i>	Joakim Amorin	Research Program Manager	30-08-2018	Helen Andreasson
	<i>Academic</i>	Monika Bellgran	First vice chair	10-09-2018	Erik Arnold
Research Council of Norway (NO)	<i>Administrative</i>	Randi Soggen	Chief of Staff	23-08-2018	Erik Arnold
	<i>Academic</i>	Edel Oddny Elvevoll	Deputy Chair of Board	13-08-2018	Erik Arnold

Organisation	Interviewee type	Name	Position	Interview date	Interviewer
Academy of Finland (FI)	<i>Administrative</i>	Heikki Männila	President	31-08-2018	Anoushka Dave
	<i>Academic</i>	Heikki Ruskoaho	Chair of the Academy Board	21-08-2018	Erik Arnold
Natural Environment Research Council (UK)	<i>Administrative</i>	Robyn Thomas	Associate Director, Operations and Research Careers	06-09-2018	Billy Bryan
	<i>Academic</i>	Ian Boyd	Chief Scientific Advisor representative	22-08-2018	Erik Arnold
Netherlands Organisation for Scientific Research (NL)	<i>Administrative</i>	Dr Remko Achten	Programme Manager, Chemical Sciences, Science Division	29-08-2018	Anoushka Dave
	<i>Academic</i>	Stan Gielen	President	24-08-2018	Erik Arnold
Swiss National Science Foundation (CH)*	<i>Administrative</i>	Angelika Kalt	Director of the Administrative Offices	06-09-2018	Billy Bryan

*It was not possible for us to schedule an interview with a high-level academic representative at the SNSF within the timeframe of this study. However, we are able to draw on our experience of two very recent studies conducted by Technopolis for the SNSF, both of which included interviews with several senior SNSF research council members, many of which touched on several issues relevant to this study. See:

Kolarz P, Arnold E & Farla K (2017) Use-inspired basic research at SNSF. Technopolis: http://www.snf.ch/SiteCollectionDocuments/SNSF_UIBR_Final_Report_by_Technopolis_May2017.pdf

Kolarz P, Arnold E, Fryges H, Krcal A, Peter V & Rentel M (2018) Impact evaluation of NRPs 59, 60 and 61. Technopolis: http://www.snf.ch/SiteCollectionDocuments/nfp_wirkungspruefung_schlussbericht_en.pdf

Figure 11: Additional consultation interviews at Formas

Interviewee	Position at Formas	Interview details
Ingrid Petersson Karin Leth	Director General Head of Administration	20-07-2018 (Erik Arnold, Peter Kolarz)
Emma Gretzer	Head of Environmental Sciences and Spatial Planning Department and deputy MD	26-07-2018 (Erik Arnold)
Gia Destouni	Former Secretary General	09-08-2018 (Erik Arnold)
Johanna van Schalk Dernfalk	Department Head & Former Senior Research Officer	08-08-2018 (Erik Arnold)
John Tumpane	Head of the Environment Department	25-07-2018 (Erik Arnold)
Lena Gustafsson	Head of the Science Council	20-08-2018 (Erik Arnold)
Markku Rummukainen	Former Secretary General	24-07-2018 (Erik Arnold)

A.2 Interview questions

Additional questions were asked in relation to each individual funder (pertaining to various points of required clarification). However, the following questions were applicable to all:

For administrative interviewees

- Who is represented at the high-level decision-making body, how are they recruited?
- Is there a person or group that has oversight and intervention power at the high-level decision-making body?
- More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?
- How are panels drawn together? How is suitability decided and ensured?
- How is oversight of the panels' activities and conclusions ensured?
- What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?
- Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?
- How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?
- What about when it comes to agreeing on and designing new funding programmes:
 - What role do scientists themselves play in such processes?
 - What is the division of responsibilities between researchers and policymakers/administrators?
 - Is there any oversight and intervention power over how decisions about future programmes are reached?
- Overall, what would you say are the greatest challenges in ensuring scientific quality and scientific legitimacy across your operations? [Prompt: how do you address these challenges? Is it working?]

For senior research council interviewees

- Who plays the greatest part in judging and ensuring scientific quality?
- Which parts of the process ensure that the funding decisions are perceived to have legitimacy?
- How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?
- What about when it comes to agreeing on and designing new funding programmes:
 - What role do scientists themselves play in such processes?
 - What is the division of responsibilities between researchers and policymakers/administrators?
 - Is there any oversight and intervention power over how decisions about future programmes are reached?
- Overall, what would you say are the greatest challenges in ensuring scientific quality and scientific legitimacy across your operations?
 - Prompt: how do you address these challenges? Is it working?

Appendix B Comparator funders – basic information templates

B.1 Swedish Research Council (VR)

Swedish Research Council (VR)	
Country	Sweden
Budget	600 million Euro
Thematic/disc. focus	All disciplines
Snapshot description	VR is Sweden's largest governmental research funding body, providing more than 6 billion SEK for Swedish research per year. VR is a government agency within the Ministry of Education and Research.

Structure of the funder

VR's **Board** is ultimately responsible to the Government for its activities. The Board consists of nine members. Six academics are elected by researchers at higher education institutions through the Electoral Assembly¹⁰. The chairman, director general and another member are appointed by the government. All employees at Swedish universities are given the opportunity to nominate members to the Electoral Assembly. Persons nominated should be scientifically competent teachers. In this context, scientifically competent teachers refer to university lecturers, professors and other teachers with doctoral degrees, with a tenured position at the university. The Board decides how much money is going to be spent in different programmes/scientific councils.

The **Director General (DG)** decides on issues delegated to him or her by the Board. The DG has an executive management team that supports different activities such as internal organisation, prioritisation of resources within the public authority or decisions relating to the funding of certain grants. The Director General is also in charge of the 5 Secretaries General (SG). The **Executive Director** supports the DG and is in charge of the head of 4 departments at the Swedish Research Council. The Executive Director is also the head of the Department of Administration and holds HR responsibility for the Central Ethics Review Board.

Three scientific councils, one council (research infrastructures) and five committees report to the board.

- **Three Scientific Councils:** (1) Humanities and Social Sciences, (2) Medicine and Health, (3) Natural and Engineering Sciences. Each council has nine members elected by researchers at Swedish HEIs¹¹, all professors. The Scientific Council for Medicine and Health have also two members appointed by the government, one from the healthcare sector and one from the pharmaceutical industry or the biotechnology industry. Their term of office is three years and members can be re-elected for a further three years. They are responsible for allocating research funding and evaluating research proposals within their respective subject areas.
- Each **scientific council**, as well as **council** and **committee** has several review panels which assess proposals submitted to VR. These members are appointed by their respective scientific council. There are between 80-90 review panels and 600-900 panel members selected from universities. The scientific councils decide (based on recommendation from the panels) which proposals are going to be funded. Approximately 90 % of all funding decisions are made by the three scientific councils, the council for infrastructure and the five committees. In addition to assessing general proposal submissions, the councils run their own national programmes and support international collaborations and deal with strategic development in the area. The councils together

¹⁰ https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-2012520-om-elektorsforsamling-vid_sfs-2012-520

¹¹ Medicine and health has two additional members appointed by the government: one from the healthcare sectors and the other from the pharmaceuticals/biotechnology sector

with the SG follow-up on and evaluate funded research as well as develop strategies for their research areas.

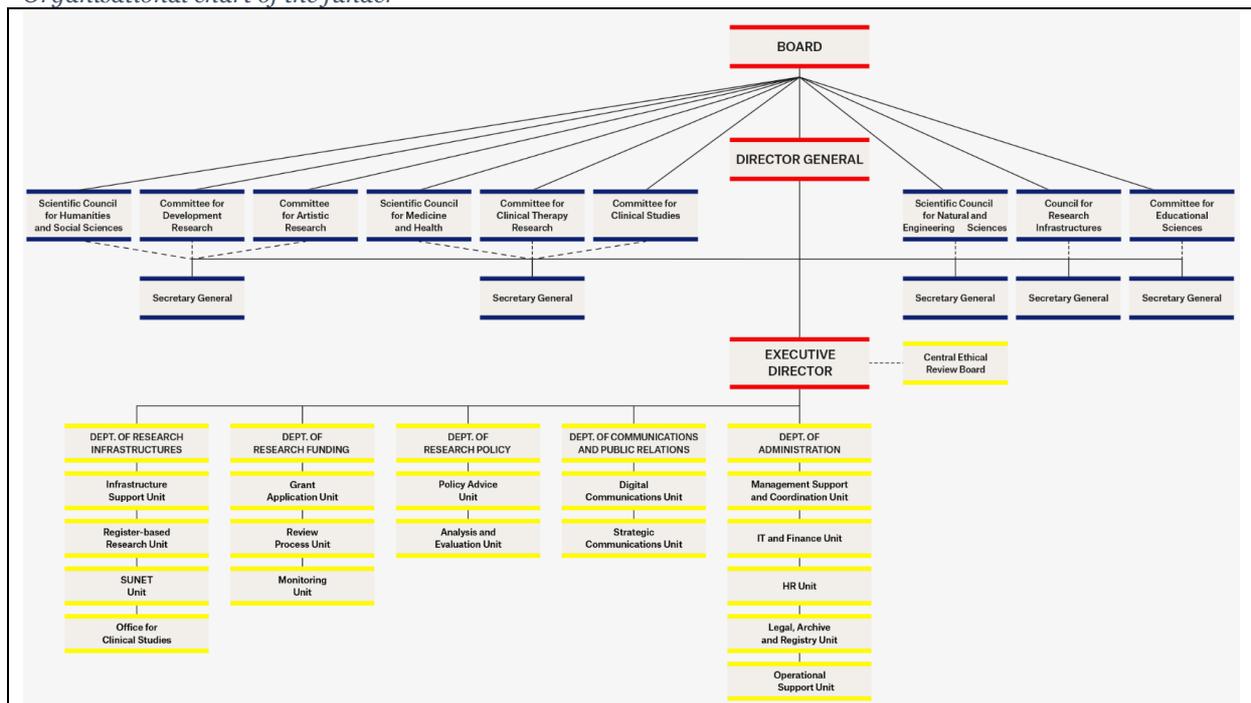
- **Council for Research Infrastructures (RFI):** RFI has three advisory groups and an e-Infrastructure committee to support the planning and prioritisation of research infrastructure. Like the scientific councils, RFI reviews proposals and makes decisions on grants relating to infrastructure. RFI has 13 members, nine of which are active researchers from different disciplines (all professors). VR appoints the chair and members based on proposals from VR's three scientific councils, and from the Forte, Formas and Vinnova research councils, who nominate one member each. The term of office is three years and members can be re-elected for a further three years.
- **Five Committees** for (1) Clinical Therapy Research, (2) Clinical Studies, (3) Artistic Research, (4) Development Research and (5) Educational Sciences. These committees have narrower remits than the scientific councils but with focused remits for the activities they fund (e.g. international development research funded using the government aid budget), some of which is more applied, for example the coordination of clinical studies. The committees are generally larger than the scientific councils (around 11 members) and consist mainly of academics. Some of the committees include members from other funding bodies (e.g. Formas, Sida) and industry. Most members are appointed based on proposals from HEIs, funding bodies, industry and scientific councils. The term of office is three years and members can be re-elected for a further term of office of three years.

There are five **Secretaries General (SG)**; one for the Scientific Council for Natural and Engineering sciences, one for the Committee for Educational Science; one for the Council for Research Infrastructure, one covering the Scientific Council for Medicine and Health and the two clinical committees; one for the Scientific Council Humanities and Social sciences covering also the Committee for Development Research and the Committee for Artistic Research. The SGs are the link between the administrative and the scientific parts of VR. The **Executive Management Team** consists of the DG (chair) and the Executive Director, the five Secretaries General, the heads of the Department of Research Policy, the Department of Research Funding, the Department of Administration, the Department of Research Infrastructures and the Department of Communications and Public Relations, and the head of the Management Support and Coordination Unit at the Department of Administration.

- The **Department of Research Policy** conducts analyses, evaluations and inquiries, which are then used as a basis for decisions by VR and the Government.
- The **Department of Research Funding** plans, prepares and coordinates the VR's calls for grants and handles the applications that are received. It takes care of the administration of the calls, control that the policies and different guidelines are followed by the Scientific Councils. The department assists in recruiting and training the researchers who will review the applications and gives them support throughout the assessment process. For instance, training in "what is conflict of interests", how gender policy works at VR etc. is provided.

The Swedish Research Council's **review panels** assess and prioritise around 6 000 applications each year based on scientific quality and the merits of the applicant. The panels consist of around 800 active researchers with expertise in different areas. The panels are appointed by the Scientific Councils, council and committees. Panel members have a one-year term but can be re-elected for a total of six years normally. The panels vary from one year to another. They prioritise and deliver a funding list of proposals.

Organisational chart of the funder



Source:

<https://www.vr.se/images/18.514d156f1639984ae07acde7/1529480525249/VR%20Organisation%20ENG%20L%201805.png>

The funding process:

The board decides how much money should be allocated in the call.

The SG together with the specific Scientific Council decides how to design the call.

Applications for research grants are assessed by review panels composed of expert researchers. They assess the scientific quality of the application using four basic criteria:

- Novelty and originality
- Scientific quality of the project
- Merits of the applicant(s)
- Feasibility

The first three criteria are assessed according to a seven-grade scale. The criterion of Feasibility is assessed according to a three-grade scale. For some calls, the basic criteria above are supplemented with specific additional criteria, such as relevance, the interdisciplinary approach or other factors applicable to the call in question. The assessment criteria used, and how they are used, is always specified in the call text. When all grades are set, the review panel weighs them together to an overall grade on the scale of 1–7. The review panel makes a joint assessment. It declares the final assessment to the Scientific Council, Council and Committee that makes the decision based upon the assessments.¹²

¹² <https://www.vr.se/english/calls-and-decisions/assessment-of-applications/how-applications-are-assessed.html>

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The Board consists of nine members. Six are appointed by researchers at higher education institutions, and three are appointed by the Government. It includes a Chair, Vice-chair and the Director General. It comprises mostly professors from HEIs. The board decides how much money per scientific area/programme VR is going to distribute.

The board delegates the funding decision to the Scientific Councils, the Council for Infrastructure and the five Committees and the Director General, depending on the area or funding programme. If a council/committee for some reason is unable to make a decision (could be due to conflict of interest), the board will decide.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

The review panel's joint assessment and how the application compares in competition with other applications forms the basis for the decision on whether an application is awarded a grant or not. *The scientific council or committee responsible for the call makes the decision.* For some calls, the decision is made by the Director General of the Swedish Research Council. There are at least 2 admin persons in the panels' meetings to ensure that the process is handled correct. They are also observers from the Scientific Councils or committees to ensure different policies and guidelines are followed.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

In accordance with the Swedish Administrative Procedure Act, public agencies must be objective and impartial and protect everyone's equality before the law. The law states, among other things, that:

- A person who is aware of a circumstance that is likely to cause him or her to have a conflict of interest must immediately notify the public agency.
- A person with a conflict of interest must not participate in the processing of the case or be present when the case is decided.

The Swedish Research Council has developed a conflict of interest policy to apply the Swedish Administrative Procedure Act to its activities. The conflict of interest policy describes what everyone who works with applications – reviewers, decision-makers, and the agency's employees – must do to ensure that each application is given an objective and impartial evaluation.

VR and the SG have a special task to follow-up on all notifications of conflict of interests.

How are panels drawn together? How is suitability decided and ensured?

The scientific council and committees draw together the review panels in such a way that the subject expertise of the members complements each other, and the panel has a collective breadth that covers the entire subject area. If the members of a review panel do not consider themselves to have sufficient expertise to assess a particular application, they will obtain help from experts outside the panel. VR can temporarily employ a scientific advisor in a special field if they do not have the capacity in-house. That person is just an advisor and cannot take any decisions.

Each review panel is led by a chair, and usually consists of five to 15 persons from different HEIs. The gender balance is even. Members are appointed for one year at a time, which can be extended for up to six years. The chair usually has a maximum term of three years.

Researchers from HEIs outside Sweden are nearly always included in the review panels. They bring competence and an international perspective to the assessment of Swedish research. Recruiting panel members from other countries is also a way of avoiding conflicts of interest. For some calls, all the review panel members are international researchers.

How is oversight of the panels' activities and conclusions ensured?

To ensure each application receives a balanced and fair assessment, a minimum of three members read it ahead of the review panel meeting. The applications are assessed according to the Swedish Research Council's four basic criteria: (1) Novelty and originality, (2) The scientific quality of the project, (3) The merits of the applicant, and (4) Feasibility. For some calls, these criteria are supplemented with specific additional criteria, such as interdisciplinarity, or some other feature that is relevant for that particular call.

All assessments are made in an equivalent manner. They are based on the scientific quality of the research planned, and on the merits of the applicant. VR trains and informs members and chairs of the review panels on how the assessment should be conducted, and on the guidelines that apply. To help them in their work, they also have a peer review handbook, which is specific for each area and call. The handbook clarifies the assessment criteria by means of a number of guiding questions.

The review panel makes a joint assessment of each application. In some calls, the review panel will screen out the applications that have received the lowest grades from the members who have read the applications ahead of the review panel meeting. These applications are not discussed in detail at the meeting. The reason for this is to give sufficient time to discuss the applications that are of good quality and have a realistic chance of being funded.

The review panel meeting is conducted as follows

- One of the panel members who has read the application presents it to the other members of the review panel. The whole review panel discusses the application and agrees on a joint, final assessment
- The application is graded on all assessment criteria and receives an individual final statement
- The applications that were screened out receive an overall grade and a standard final statement
- The chair of the review panel leads the meeting, with the help of personnel from the Swedish Research Council. Together they ensure that the guidelines are followed and that the outcome of the meeting is documented. As part of the quality assurance process, in many cases observers from the scientific council or committee are present at the meeting.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

Scientific quality is judged by experts in the review panels. The panels are independent and appointed by the Scientific Councils or Committees. The Scientific Councils are elected by researchers from different Universities (through the Electoral Assembly).

The Scientific councils and the Committees take the decision on funding.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The review panels consisting of experts as well as the Scientific Councils and Committees are the most important part of the process, especially assuring that the panel has the right competence and mix of researchers with no conflict of interests and that the evaluation processes are correct and that the experts follow VR's policy and guidelines.

It is very important for VR that the recommendation from the panels and the decision by the council and committees are made by “independent” researchers and assessments are made in line all with policies and guidelines to avoid corruption.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

The Swedish Research Council has produced eight fundamental principles for ensuring the scientific assessment is made within the framework for a sound assessment culture and good research practice.¹³

- Each principle has a number of associated guidelines that provide support in the practical work of assessing the applications.
- The principles and associated guidelines must be interpreted in relation to each individual call. All those who work with applications – administrators, subject experts in the review panels and decision-makers – discuss how the principles shall be applied in practice, for example if one principle conflicts with another.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

The different Scientific Councils and Committees never change their decisions. An annual review is written and communicated to the board. There is a transparency within the process.

VR follows up the assessment process every year. For example, the review panel meetings end with a discussion where the members have the opportunity to give feedback on various parts of the process. This feedback becomes part of the documentation used by the Swedish Research Council to optimise and develop processes for assessment of applications.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Approximately 50 % of all VR staff have PhDs, however the proportion of PhD varies among departments.

Programming: decision-making and balancing between scientific and extra-scientific considerations

The board decides if VR is going to run a new programme, which is often based on the government’s wishes.

The SGs design the programmes in collaboration with the councils, which also decide how much they are going to fund and what kind of funding instrument they are going to use.

The SGs also do some road trips to the University/academy/science society to have a dialogue for example. about specific areas and types of calls.

¹³

https://www.vr.se/download/18.514d156f1639984ae07443a6/1529480566970/Guidelines_for_peer_review_SwedishResearch_Council_short_intro.pdf

B.2 Forte

Forte	
Country	Sweden
Budget	600 million SEK for 2018, 650 million SEK for 2019
Thematic/disc. focus	3 areas: Health, Welfare and Work life
Snapshot description	Forte is a government agency, with approximately 30 employees, under the Swedish Ministry of Health and Social Affairs, with responsibilities in the areas of health, working life and welfare. In 2013 the mandate was expanded to also include research within care sciences. Forte funds basic research of the highest scientific quality and applied research on the behalf of the government as one of its six research councils. Forte's mandate is also to identify knowledge gaps and evaluate research. Collaboration with the research community, other agencies and relevant stakeholders in the community is another key task. The Research and Innovation Bill 2012/13:30 also stresses that Forte shall support innovative, applied research and contribute to greater knowledge of the mechanisms for successful implementation, which means long-term research into the way research results can be used and translated into concrete practices. Centres, grants and fellowships are the main funding instruments.

Structure of the funder

Forte's board has the ultimate responsibility in all decisions concerning Forte's operations including funding decisions. The board consists of a chairperson and 12 board members and has a three-year mandate. Seven members are elected by the scientific community. The chairperson and four members representing the public interest are appointed by the Government. Three ministries decide and select who is going to sit on the board. Forte's Director General is also a member. The board of Forte has decided on a Strategic Agenda for 2015–2018. This strategy covers the agency's activities within: (1) research and development, (2) collaboration and communication of research and its results, and (3) efficient and transparent processes and systems. Nine of the board members have a PhD.

The Director General is the head of all operations at Forte, including delegated decisions from the Board. The Director General mediates if there are problems with researchers who have not finalised their report before applying for new funding.

Forte's nine **senior research officers** are responsible for Forte's scientific operations including the evaluation process, which means they appoint experts for the panel and act as secretaries at committee meetings. They are also responsible for developing new funding programmes.

The **Secretary General (SG)** is an active researcher who works at Forte part time (50%). S/he guarantees the scientific quality at Forte and is appointed by the Board but is not part of the Forte organisation.

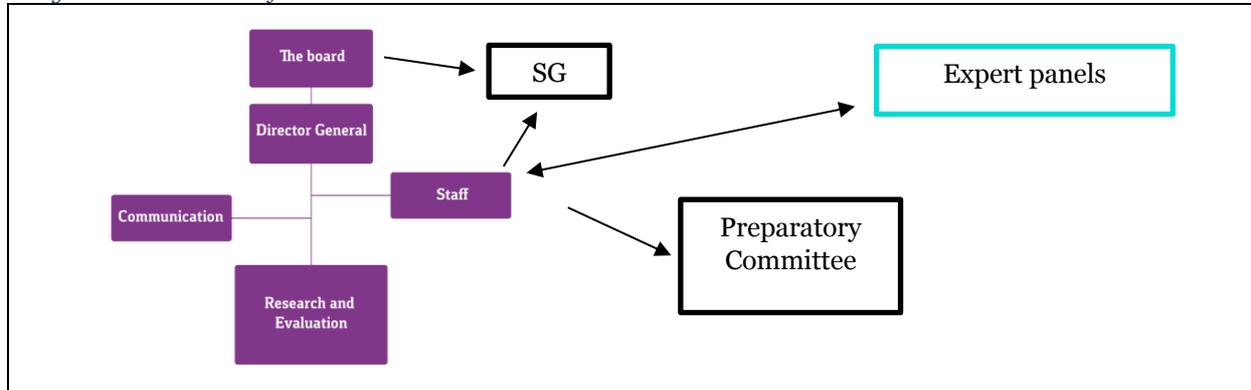
The research and evaluation department at Forte is responsible for all administration during the evaluation process, issuing calls for proposals for research funding, international cooperation, and reviewing and identifying research needs in Forte's areas of responsibility. It is also in charge of administrative processes and procedures related to preparation and monitoring to ensure an effective, transparent and legally sound process.

Applications within the annual open call for proposals are assessed by **10 different panels** with different focus areas. Each panel is composed of senior researchers from a variety of relevant disciplines, with representation from other Nordic countries. The panels also include community representatives to ensure public interest and social relevance in research funding. The panels are appointed by an external senior researcher and a senior research officer from Forte. The focus and composition of the scientific panels is decided by Forte's board.

The staff provides advisory and coordinating support to the Director General. Forte's SG, with responsibility for Forte's scientific operations, is not included in the staff. S/he has more of a monitoring

role. The staff's responsibilities include human resources, financial planning and accounting, procurement as well as contractual and office services. The department also has the responsibility to manage and develop Forte's overall operations.

Organisational chart of Forte



The funding process:

Submitted applications are handed over to a preparatory committee.

Applications are distributed to external experts for assessment. Expert panels assess and review the research applications submitted to Forte. The expert panels consist of leading researchers and representatives from Forte's areas of responsibility including health, working life and welfare. The panels also include community representatives to ensure public interest and social relevance in research funding. The panel that assesses the application will depend on the current call and the subject of the research. Expert panels make their assessment based on both the scientific quality of the applications and their societal relevance. Forte's board makes the decisions. The scientific secretary recommends which applications should be funded and the SG presents the recommendations to Forte's Board.

Applications within the annual open call for proposals are assessed by 10 different panels with different focus areas. Each panel is composed of senior researchers from a variety of relevant disciplines, with representation from other Nordic countries. There are three scientific panels within health, four scientific panels within working life and three scientific panels within welfare. Each panel is composed of 8-10 persons.

The application process for project grants and junior researcher grants is divided into two stages. In stage 1, researchers submit a project outline to Forte. When the call closes, Forte's review panels decide which project outlines will be accepted for stage 2. In stage 2 of the application process, researchers are given the opportunity to submit a full application.

Postdoctoral grants involve only one stage. If the application is accepted by Forte's scientific panels, individuals are asked to supplement their application with their thesis and other writings in electronic format.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

Forte's board has the ultimate responsibility in all decisions concerning Forte's operations and funding. The board consists of a chairperson and 12 board members and has a three-year mandate.

Seven members are elected by the scientific community. The chairperson and four members representing the public interest are appointed by the Government. Forte's Director General is also a member.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

The Director General has oversight. The head of research and evaluation is responsible for the administration part. The SG is responsible for the scientific part.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

To ensure that the assessment process is as objective as possible, Forte has a conflict of interest policy in place for the board and review panels. Web-based training on how to evaluate correctly is available for all experts. A person who according to the policy has a conflict of interest may not be present at the assessment or decision of the concerned application. It is up to the responsible scientific secretary to check all persons in the preparatory committee. The scientific secretary also attends the meeting. Each expert is obliged to announce whether they have a conflict of interest.

How are panels drawn together? How is suitability decided and ensured?

The focus and composition of the scientific panels is set by the scientific secretary. The decision is made by Forte's board of directors.

How is oversight of the panels' activities and conclusions ensured?

The secretary general oversees the panels' activities and conclusions.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

With help of the experts and the preparatory committee the assessment is ranked, the SG presents a recommendation for the Forte's Board, Forte's board take the final decision on which applications will be granted. For larger grants, such as Research Project Grants, Postdoc Grants and Programme Grants, it is Forte's board that makes the final decision. For smaller grants such as Visiting Researcher Grants, Publication Grants and Network and Conference grants, qualified staff in the Forte office make the decision.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

Selection of external experts and to set a panel. The applicant can in advance see who is sitting in which panel, that means applicants can choose a call with another panel if the applicant wants. The preparatory committee is also important where all the rankings are done. The Forte Board does not read any applications.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

Forte use 0, 1, 2 and grade all criteria "scientific quality, social relevance and utilization, implementation" with only one digit. The entire application receives a number. A final discussion ends with a ranking list.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

The Forte Board never changes a decision and follows the recommendations of the SG.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

The scientific secretary does not need a PhD.

Key staff such as the SG, Director General and the head of research and evaluation have a PhD. Almost every expert in the panels has a PhD.

Programming: decision-making and balancing between scientific and extra-scientific considerations

Forte has collaborated, for example, with researchers, user organisations and The Swedish Agency for Participation (MFD). These contacts have helped to identify research needs and priority areas for the call for proposals.

B.3 Vinnova

VINNOVA	
Country	Sweden
Budget	300 Million Euro
Thematic/disc. focus	5 main thematic areas: circular- and bio-based economy, travel and transport, life science, industry and materials, smart cities
Snapshot description	<p>Vinnova is Sweden's government agency for innovation. Its mission is to contribute to sustainable growth by improving the conditions for innovation. It mainly funds innovation projects and the research needed to develop new solutions, but it also invests long term in strong research and innovation environments.</p> <p>Each year, Vinnova invests around 300 Million Euro. Most of these funds are allocated via calls for proposals in which companies, public sector actors and other organisations apply for funding. All investments are continuously monitored and evaluated, and they regularly analyse the impacts of their investments.</p> <p>Vinnova is a government agency under the Ministry of Enterprise and Innovation, and the national contact authority for the EU Framework Programme for Research and Innovation. Vinnova is also the Swedish Government's expert authority in innovation policy. Vinnova employs just over 200 people and has offices in Stockholm and Brussels. The new Director general, Darja Isaksson, will start in August 2018.</p>

Structure of the funder

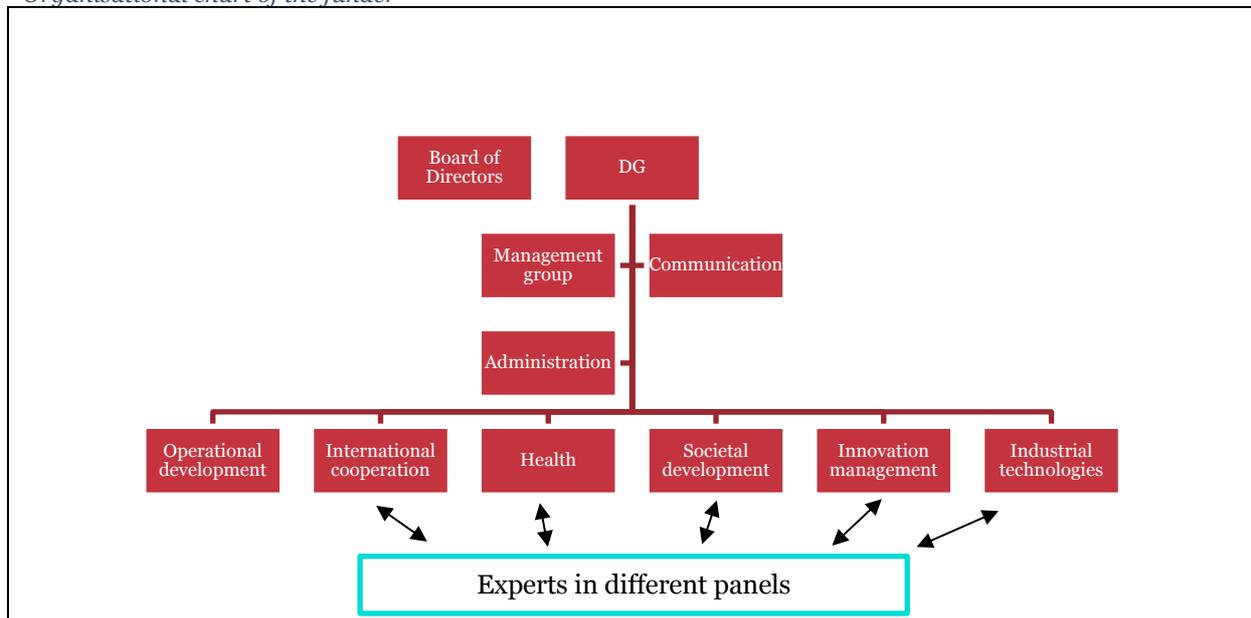
Vinnova's **board of directors** comprises 11 persons, where seven persons are appointed by the Ministry of Enterprise and Innovation and two persons are representatives from the union. The seven appointed persons come from different areas, and they have different backgrounds for example from the financial sector, entrepreneurial sector. Two persons are from the academy and one from a county council. Two of the seven persons have a PhD. The chair of the board is among the seven persons appointed by the ministry. The board supports the Director General (DG) in strategic questions, such as priorities of different financial instruments or more/less international grants. The DG is *ex officio* a member of the Board

Vinnova's **Director General** has the highest decision-making power.

Vinnova's **management group** includes nine persons where six directors come from each unit (health, international cooperation etc.) and the rest (three persons) are from communication, DG and DG assistant. All persons in the management group have a least a university degree. Funding decisions follow a scheme: the director of a unit can take decisions up to 1 M €, the head of a department up to 0,5 M € and the DG can take funding decisions above 1 M €.

Vinnova's programme managers appoint the external experts for a panel, where the evaluation processes and funding recommendations are made. Every programme has different panels. The decision of who is going to be in the panel is up to the Director. Each panel is different, and the programme determines what kind of persons are needed for the evaluation process. There is a chairperson per panel and that person can be internal or external. Vinnova is a matrix organisation which means that people from different departments always work together in a programme. 4-5 programme managers work with each panel. The experts are always appointed before the programme opens. They can be appointed for 1-3 years and often this can be extended.

Organisational chart of the funder



The funding process:

Once Vinnova receives the applications, they are reviewed internally and those applications that are incomplete or do not meet requirements are removed. This is done first by a web-based tool and then by the programme managers.

The applications that are correct and complete are distributed by the programme managers between different experts in the panel. There are at least 3 experts per application. To have a high quality evaluation process all experts undergo an “evaluation training course”, where conflicts of interest, gender, equal opportunities and meeting culture are discussed.

Once the experts have evaluated the applications, using the main criteria with a web-based tool, there is a meeting with the experts and Vinnova’s programme managers (from different departments). The importance of the 3 criteria can differ from one programme to another.

At the meeting, experts and Vinnova programme managers discuss the applications. The panel finally recommends which applications should be funded. In some cases, they call the applicants to an interview before the Director decides. The recommendation of the panel includes information on the applicant, how much of the expenses Vinnova will cover for each organisation and a motivation of why Vinnova are funding the project or not. Every application gets a motivation.

How long the decision process takes depends on how many applicants there are and also on the complexity of the application. Each year Vinnova administers 4500 applications. All funded projects are presented on its website. All information of who was sitting on the panel is public.

When the experts review applications, Vinnova have three main criteria:

- **Potential:** what effects and what value are expected from the project, and what significance it will have for society if the project achieves its goals
- **Actors:** Vinnova assess the participants' ability to run the project and achieve desired results and effects

- **Feasibility:** how realistic and credible the project plan is, both to implement the project and to achieve the desired results

The criteria are weighted differently in different programmes.

Vinnova often have a two-stage process: they fund interesting applications with seed money, so they can apply for a full project later. On average 30 % of all who apply receive funding in competition with others. However, that differs between the programs. In some programs close to 10% receive funding and in other cases higher percentage receive funding, which is largely due to the use of a ‘two/three-stage process’. Budget limits mean that an applicant may be rejected even though they may meet all the criteria. The decision cannot be appealed, but everyone who is rejected is welcome to apply again at the next application round or for a different call.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The highest decision-making person is DG. The management group decides where to allocate funding in which programs together with DG. The Board decides on strategic questions.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

No

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

The assessment process is already determined before the announcement. Programme managers distribute the applications carefully to the experts and avoid all conflicts of interest. The experts also need to announce whether they have a conflict of interest.

How are panels drawn together? How is suitability decided and ensured?

Programme managers together with a team of 3-4 other Vinnova employees appoint the experts. They decide whether they are suitable for the programme. The Director of the department takes the decision.

All programmes use external assessment. The number of external persons in the panel can differ from one programme to another. There are around 1000 persons on the list of external persons. The expert persons are usually from different networks of Vinnova. These persons come from different areas and the final composition of a panel reflects the aim of the programme.

The programme manager and several of Vinnova’s employees are involved in education and training of external experts. That facilitates the work throughout the whole assessment process.

The programme manager and the team selects, in a systematic and thoughtful manner, external persons based on competence, area skills and gender balance in the assessment group. Vinnova through the programme manager also builds and maintains the list of experts.

How is oversight of the panels’ activities and conclusions ensured?

Every expert assessment in the panels is complemented with an internal Vinnova person to create a learning process within Vinnova and to quality assure the experts.

Sometimes the panels and the programme manager take advantage of interviews to clarify things in the application. There are also guidelines for an interview.

- Interviews are conducted as part of the assessment work, during or after the assessment meeting.
- The purpose of the interview is to increase understanding of the application, the project and the actors.
- Interview should result in clarification and increased support in decision making.
- It is important that the interview is conducted based on the principle of equal treatment and gender equality.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

The panels compile assessments and recommendations for decisions. This ensures that, with the support of the documentation, Vinnova can respond to any conflict of interest.

The programme manager conducts a decision meeting with the decision-making director, as well as any steering group or other interested persons. The programme manager ensures that all documentation to support a transparent decision-making process is followed.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The most important thing is to find qualified experts and a relevant mix of people in the panels. At the assessment meetings with internal/external persons, discussion and ranking of applications in programmes can span very different areas (e.g. companies in high-tech areas versus traditional low-tech areas).

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

Relevance, potential and actors are always used as criteria. Scientific quality is not specifically used.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

There are guidelines and policies for how to conduct the assessment process. The programme manager presents the recommendation from the panel to the director, so he/she can take the final funding decision. The DG gets an update at the management meetings. The Board is not involved in decisions made in different calls.

- An independent external chair or an internal Vinnova person is present at the meeting who will help the experts to reach an agreement.
- There is a gender focus in all aspects of the meeting and the management of applications.
- A secretary (almost always a Vinnova person) must capture the discussions and write the subject directly in the web-based assessment tool to at least get the most important points, preferably for each criterion.
- Experts that have conflict of interests must leave the room.
- Discussions start from the ranking list and begin from top-the highest ranked (green ones).

- The assessor who is the rapporteur tells everyone what the application is about and gives his own opinion. Everyone who has read it should be allowed to speak.
- Those who have not read the proposal may ask questions and are given the space to share thoughts and knowledge about the specific application, so important information/knowledge is shared within the group before deciding.
- Afterwards, a couple of highest ranked proposals (greens) and a couple of the applications that have been ranked lowest before the meeting (red) are discussed. A large part of the discussion is devoted to the many applications that are close to green and therefore close to being approved.
- The programme manager/communicator communicates a decision after it is formally taken. They communicate decisions on rejection before or at the same time as the awards.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

There are no requirements for a PhD.

Programming: decision-making and balancing between scientific and extra-scientific considerations

Influences for a new programme can come from internal or external persons. The next step is to conduct 1-3 workshops with a mix of people – policy people, researchers and users.

If there is a positive feedback from this workshop, the programme manager together with the head of a unit writes the programme text. The management group then decides.

Before the programme is realized the scientific community participates at workshops as well as everyone else that have an interest. In the workshop it is possible to discuss content and express opinions concerning the design etc.

B.4 Swedish Energy Agency

Swedish Energy Agency (SEA)	
Country	Sweden
Budget	According to Proposition 2016/17:66 SEA has SEK 1.6 billion in support to fund research, innovation, demonstration, development commercialisation activities within the energy field. ¹⁴
Thematic/disc. focus	Research, innovation and commercialisation within the energy field
Snapshot description	<p>SEA funds all types of instruments, both grants and loans. Roughly 75 people work in the R&I arm of the organisation.</p> <p>The SEA supports research activities across the entire innovation system: basic research, applied and experimental development, demonstration, commercialization and dissemination of research-based knowledge and results.</p> <p>A sustainable energy system benefits society. The SEA has an overall picture of the supply and use of energy in society. SEA works for a sustainable energy system, combining ecological sustainability, competitiveness and security of supply. The Agency</p> <ul style="list-style-type: none"> • Develops and disseminates knowledge about more efficient energy use to households, industry, and the public sector • Finances research for new and renewable energy technologies, smart grids, and vehicles and transport fuels of the future, and a range of other energy-related fields • Supports commercialization and growth of energy related cleantech • Participates in international collaboration with the aim of attaining Swedish energy and climate objectives • Manages instruments such as the Electricity Certificate System and the EU Emission Trading System • Provides energy system analysis, energy forecasts and official energy statistics <p>The SEA is subordinate to the Ministry of the Environment and Energy and regulated by the government through the instruction and annual appropriations directives. The parliament and the government decide on the assignments and budget of the Agency.¹⁵</p>

Structure of the funder

The Energy Development Board of SEA decides on support to research development and demonstration within the area of energy. Its members are appointed by the Government for a fixed period. Currently Half its members represent Higher Education Institutions (HEIs) and half represent the business sector. The Board decides on major research projects (1 M € and above), while other decisions are made by the Agency's Director General and Heads of Departments (less than 1 M €) or Heads of units (up to 0,5 M €).¹⁶ Currently, the board consists of 11 members.

Advisory Council. The Director General of SEA is chairman of the Advisory Council and informs the Council of SEA's activities. The Advisory Council is appointed by the government. It has seven persons, where three comes from the politics, two from public/private authorities and two from non-profit organisations. The Advisory Council gives advice to the Director General.

Internal Audit. SEA has a function for internal audit. Recently, an internal function for evaluations has been established.¹⁷

Secretariat of the Director General supports the Director General with daily operations.

The Energy Efficiency Council will strengthen government cooperation and increase transparency in the energy efficiency field. Its task is to strengthen government cooperation, promote implementation

¹⁴ <http://www.energimyndigheten.se/forskning-och-innovation/forskning/>

¹⁵ <http://www.energimyndigheten.se/en/about-us/>

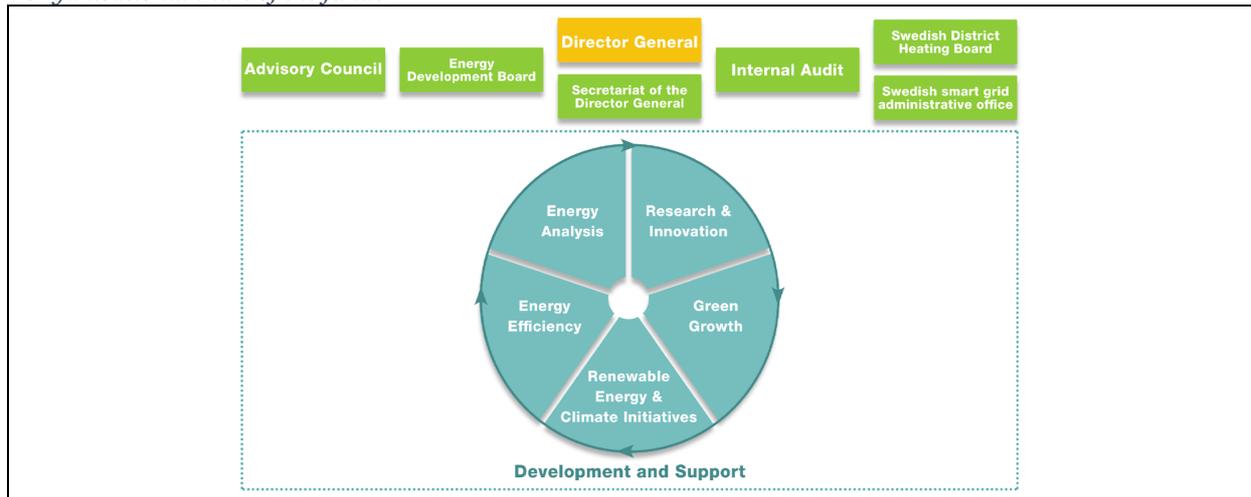
¹⁶ <http://www.energimyndigheten.se/en/about-us/our-organisation/>

¹⁷ Energimyndigheten. "Årsredovisning 2017".

and monitor measures and instruments to meet the objectives of energy efficiency set by the Parliament. The Energy Efficiency Council has an advisory role and its members meet four times a year. The Energy Efficiency Council is appointed by the SEA and Anita Aspegren (SEA) is its current chairman.

To ensure that the activities (of SEA) meet the overall strategy a portfolio strategy is applied which follows a logic model (effect logic). For each year, SEA describes the needs for activities and funds for each of the thematic areas (prioritization of activities). Later, this results in projects and research programmes.¹⁸

Organisational chart of the funder



The funding process:

The SEA funds everything from basic to applied research, covering the whole innovation system. The criteria vary depending on the announcement, from 100% - 10% funded projects. The SEA decides on which strategic initiatives are to be taken.

A large part of the R&D activity funded by SEA is through (mostly open) calls of different orientations. Each call has its own specific rules.

The SEA has continuously “open” calls where decision is taken at certain given time where all proposals are evaluated against each other’s and according to strategic priorities. This is for instance the case for pilot & demonstration projects. Projects that fall within the scope of a programme have to be applied for within the programme’s calls.

Based on our own experience of SEA’s funding process:

There are two overarching funding systems for SEA’s programmes.

First: Programmes have a fixed budget for up to six years and have one or several open calls. Then, the programme board (it can be a review panel as well) consisting of different stakeholders reviews the proposals and rank according to the criteria for the call, resulting in the recommendation to SEA (the programme manager, head of department, head of unit or director general, or even the Energy Development Board). The programme board’s (or panel’s) approach of how they review the proposals differ between the programmes. However, most often all the board members have access to all applications and these are then jointly discussed on the meetings.

Second: The next type of funding process is that SEA allocates funds to an external actor (a fixed budget for a fixed number of years) that is responsible for allocating the funds during the programme period. This kind of funding process also usually involves

¹⁸ Energimyndigheten. ”Helhetssyn är nyckel”.

a board of stakeholders that makes recommendations of which project should be funded. In contrast to the first example, SEA has the mandate to take the final decision and there are no open calls. This approach is used specifically for the many competence centres funded by SEA.

There is an eligibility check (by the programme manager + preparatory committee) before distributing applications to experts. A preparation committee, 8-12 persons, has an external chair and the people are appointed by the programme manager (decided by the head from the same unit) from academia, industry and public sector. An expert can be appointed for 1-3 years. The SEA has a 3-step evaluation process. First, assessments are made by external experts, then a preparatory committee ranks the proposals and thereafter a final internal quality evaluation is conducted by the head and programme manager team. The final decision is always made by SEA or the Energy Development Board.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The Energy Development Board (grant decisions of 1 M € and above) consists of 11 members of which five are from the industry, five are from HEIs. The director-general of SEA is the Chairman of the board. The Government appoints members to the board.¹⁹

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

No, except for the advisory council that gives advice to the Director General.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

In general, there are guidelines for conflicts of interests, e.g. if a preparatory committee member has conflicts of interest, s/he is not qualified to review and make recommendations on this application.²⁰ Two persons from SEA attend and monitor the preparatory committee meeting.

How are panels drawn together? How is suitability decided and ensured?

The preparatory committee members usually represent the stakeholders of the programme (from different R&D sectors such as industry, HEIs, public bodies etc.) and have thematic or other kinds of industrial/private sector expertise (not necessarily scientific). Often somebody in the board has an international perspective (most often from one of the Nordic countries).

How is oversight of the panels' activities and conclusions ensured?

Generally, the programme manager (SEA) and one more person from the SEA oversee this process. In the case where an external actor has been allocated funds for running a programme, the principal of an HEI that might oversee this process. However, many competence centres use an international advisory board that advises on the content of projects/proposals.²¹

In addition, most programmes and larger projects are evaluated ex post by an external entity.

¹⁹ <http://www.energimyndigheten.se/om-oss/organisation/eun-och-insynsradet/>

²⁰ <http://www.energimyndigheten.se/contentassets/caa0592b976d43a2bf3caa9d3eda481a/programbeskrivning-samverkansprogrammet-fornybara-drivmedel-och-system-2018-2021-dnr-2017-004279.pdf>

²¹ Competence centres have a 1/3 financing model: 1/3 from SEA, 1/3 from Academia, 1/3 industrial actors.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

SEA or EDB takes the decisions and experts/preparatory committee make recommendations.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

Broad competence in the preparatory committee and the criteria used to prioritise the individual applications/proposals. These criteria are there to ensure that the proposals are in line with SEA's objectives. The criteria are also used to increase transparency regarding SEA's mission, both for decision makers and for applicants.²² One criterion is scientific excellence and innovation capacity. However, it also depends on the type of project that is financed. Scientific excellence is not necessarily of primary importance for pilot or demonstration projects or for commercialisation support grants, but will have much higher importance for basic research projects.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

The criteria are weighed differently depending on the funding scheme type (see above). Some initiatives have been split into two to ensure that there are no conflicts between basic research and applied research. One example is the competence centre CECOST.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

The Energy Development Board receives information, such as evaluation reports, and in some cases recommendations from external committees, for making decisions for funding of larger projects and programmes.

For programmes and larger projects, the programme manager presents to the board (or a similar group that are responsible for assessing the proposals). The board then makes recommendations to SEA of which proposal to fund, SEA (most often the manager of the programme, but it can be head of department or even the Director General) then makes the final decision.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

According to the latest annual report, 89 percent of the staff have an academic degree, and rises to 100% in the R&I arm of the organisation, including many PhDs, including programme managers and directors.

Programming: decision-making and balancing between scientific and extra-scientific considerations

The Energy Development Board has the mandate to take the decisions regarding funding large projects. The Board continuously receives updates about SEA's strategies and other preparatory documents.

²² Energimyndigheten. "Helhetsyn är nyckeln".

B.5 Strategic Research Foundation (SFF)

SSF, Stiftelsen för Strategisk Forskning	
Country	Sweden
Budget	70 M Euro (2018)
Thematic/disc. focus	<ul style="list-style-type: none"> • High-priority areas for the Swedish Foundation for Strategic Research (SSF) are • Information, Communication, and Systems Technologies (ICT) • Life Sciences with a focus on Technologies and Bioengineering • Materials Research with a focus on new and better functionality and Production.
Snapshot description	<p>The objective of the SSF is to support research within the natural sciences, engineering and medicine. The Foundation promotes the development of strong research environments of the highest international standard and of significance for the development of Sweden's long-term competitiveness. One of SSF's roles is to bridge the gap in the funding chain between basic research and innovation- or need-driven research.</p> <p>SSF has 15 employees which includes 6 scientific secretaries (SS), 8 administrators and the Chief Executive Officer.</p> <p>SSF funds research in science, engineering and medicine via grants totalling approximately SEK 700 million annually.</p>

Structure of the funder

The **Board at SSF**:²³ Two members are appointed by the Government. At least one of the members appointed by the Government needs to have relevant financial qualifications. Other members are appointed as follows: Two members appointed upon nomination by the Directors General of the Swedish Research Council (VR), the Swedish Council for Working Life and Social Research (FAS), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), and the Swedish Governmental Agency for Innovation Systems (Vinnova); two members appointed upon nomination by universities and colleges; three members appointed upon nomination by the Royal Swedish Academy of Sciences (KVA) and the Royal Swedish Academy of Engineering Sciences (IVA); and one member appointed by the Board of SSF. Before submitting nominations for Board members, the nominating bodies shall consult with each for the purpose of achieving a well-rounded composition of the Board in terms of qualifications and gender. The nomination for the members of the Board is three years, renewable for one term. If a Board member resigns during his or her term, a new member is appointed for the remainder of the term. Such a replacement is nominated and appointed in the same way as the member to be succeeded was appointed. Board members appointed by the Government can be dismissed by the Government. Other members can be dismissed by the Board. The final funding decision is taken by the Board. It also decides on new funding programmes.

The Board appoints a **Chairman and Vice Chairman from among its members**. In the event of a tie, the Chairman casts the deciding vote. Minutes of the Board meetings are taken.

The Royal Swedish Academy of Sciences (KVA) and the Royal Swedish Academy of Engineering Sciences (IVA) can review the Foundation's activities but not impose sanctions.

The board delegates some duties to **the Chief Executive Officer (CEO)**, such as the management of the day to day operations. S/he is assisted by a secretariat of 15 persons (six scientific secretaries, one research programmes manager and eight administration, communications & economy persons) and is in charge of the Foundation's operational activities. All of the employees reports to the CEO.

²³ <https://strategiska.se/app/uploads/stadgar-2016.pdf>

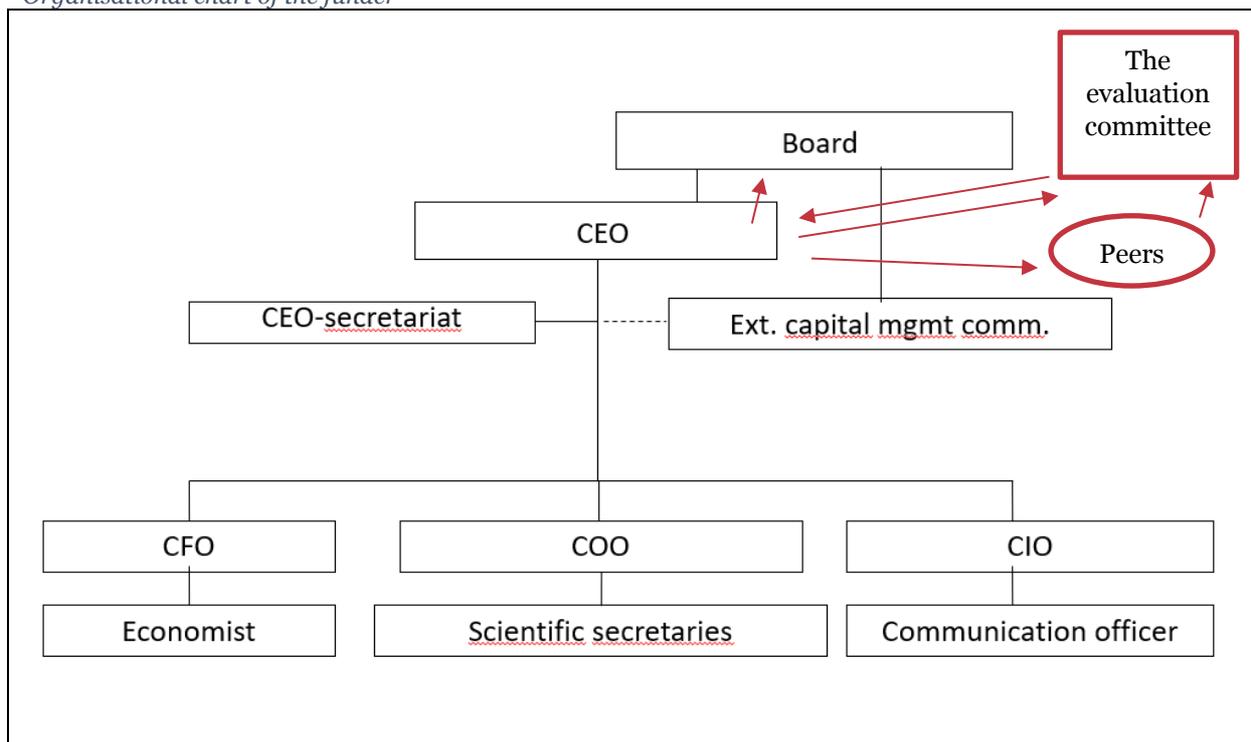
The research programmes manager (COO) is responsible for guidelines regarding reviews of applications, project follow-ups and program evaluations. All important policy documents, such as conflict of interest, are decided every year by the board.

The CEO decides (based on a proposal by the scientific secretary) who will be appointed members in **an evaluation committee** (*beredningskommitté*). The evaluation committee is responsible for carrying out the review process for applications within an advertised programme. The committee consists of 5-12 persons from industry, academia and society in general who have preparatory meetings where they discuss the ranking of the proposals.

The scientific secretary appoints **international experts** for a distant peer-review process. There are normally three external experts per proposal. The evaluation committee use the information from the external experts as well as their own expertise as a basis for their recommendation to the CEO of the foundation. The CEO uses their material to prepare the proposal before the board.

The Foundation has a staff of 15 people including six scientific secretaries in six different areas. Scientific secretaries independently plan and process contributions to major research programmes. This includes writing call texts, handling applications on the electronic platform, leading the preparation process, writing decision letters and contracts, contacting beneficiaries, assessment teams and external experts, conducting mid-term and final evaluations, as well as world-wide business.

Organisational chart of the funder



The funding process:

The Foundation funds Swedish research via research group grants, individual grants, graduate schools, centres and grants to promote greater mobility. SSF has three programmes to promote mobility, two programmes aimed at young successful researchers and also sponsors one graduate school.

The Foundation acts strategically²⁴ in its choice of research areas and types of grants, always with open calls for proposals. Examples are framework programmes within strategically vital fields of research, career grants, and other targeted initiatives. The aim is to encourage interdisciplinary collaboration, exploitation of research results, use of research infrastructure, and mobility between academia and industry as well as between different countries. The Foundation selects projects based on two main criteria: (1) Relevance and expected industrial/societal impact and (2) Scientific quality (no specific weight per sub criteria). In addition, different sub criteria are applied from case to case such as interdisciplinarity, internationalization, mobility between sectors and leadership. The Board is responsible for ensuring that the Foundation's assets are managed in a prudent manner to limit risks and secure a satisfactory yield.

After the application deadline, the preparation begins.

- The CEO at the Foundation appoints an evaluation committee (via suggestion from the scientific secretary) which is responsible for carrying out the review process for applications within a specific programme.
- The committee consists of 5-12 members from academia, industry and society in general.
- SSF submits proposals to the external experts (international) to conduct peer review remotely.
- In most major calls for proposals, the application is sent to at least three external experts. Based on the opinions of the external experts and the evaluation committee's own scientific and strategic assessment, the committee ranks submitted applications.
- The committee then submits a well-motivated proposal for which applications should be funded, including the grant size, to the CEO of SSF.
- Normally, the chairman of the evaluation committee presents the recommendations and motivations of the evaluation committee before the Board. The CEO makes the formal proposal of the granting decision, including budget, to the board.
- Final grant decisions are taken by the Board of Directors.

Applicants are usually kept informed during the preparation period. Information such as application statistics and schedules are provided. As soon as the protocol from the Board meeting is adjusted, applicants are notified of the result. Contracts, including SSF's terms, are usually sent out approximately 1-3 weeks after the Board has made the decisions.

The Foundation's goal is that the time between the application deadline and the decision of the Board should be about 6-9 months for targeted calls (for example, announcements within only one of the Foundation's areas) and about 9-12 months for broad announcements (for example, announcements covering all Foundation Areas).

The research funded by the Foundation is evaluated on a regular basis. Annual project reports are examined, and approved internally and mid-term reports are evaluated by an external experts committee.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

Final grant decisions are taken by the Board. The Board has 10: two appointed by the Government, where one must have relevant financial qualifications and eight other members appointed by the Board. Of these eight, two members are appointed upon nomination by the Directors General of the Swedish Research Council (VR), the Swedish Council for Working Life and Social Research (FAS), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), and the

²⁴ <https://strategiska.se/app/uploads/ssf-research-strategy-2017-21.pdf>

Swedish Governmental Agency for Innovation Systems (Vinnova); two members are appointed upon nomination by universities and colleges; three members are appointed upon nomination by the Royal Swedish Academy of Sciences (KVA) and the Royal Swedish Academy of Engineering Sciences (IVA); and one member is appointed by the Board.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

No, the board members are independent.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

There is a policy document for "the person handling the case". The policy concerns both those who prepare and review and those who appoint members of the board, external assessors or officials, thus anyone who may influence the outcome of an application. A scientific secretary is present in all preparatory meetings.

How are panels drawn together? How is suitability decided and ensured?

SSF submits proposals to external experts, mainly international peers. Each proposal is sent to three experts. The scientific secretary recommends experts and decides which expert is reading which proposal.

The CEO appoints (based on suggestion from the scientific secretary) an evaluation committee (beredningskommitté) which is responsible for carrying out the review process for applications within a specific programme.

The committee consists of 5-12 members from academia, industry and society in general.

How is oversight of the panels' activities and conclusions ensured?

The scientific secretary has oversight over the evaluation committee. The peer-review process is done digitally and distantly.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

The evaluation committee ranks and recommends proposals for funding.

Experts do the assessment/peer-review and grade the application.

The highest level of decision-making is the board.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The appointed experts for the peer-review process (distance reviewers) and the evaluation committee (physical meeting). The scientific secretary is monitoring conflict of interest.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

All applications must meet the standards on all three main criteria (scientific quality, strategic relevance/impact and the scope of the specific programme).

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

The evaluation committee submits a well-motivated proposal for which applications should be funded, including the grant size, to the CEO. Normally, the chairman of the evaluation committee presents the recommendations of the committee to SSF's Board. The CEO makes the formal proposal of the decision, including budget. Final grant decisions are taken by the Board.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Most scientific secretaries have PhDs, corresponding competence or higher.

The chief executive officer is a chaired Professor (leave of absence) and the research programme manager have a PhD.

Programming: decision-making and balancing between scientific and extra-scientific considerations

The CEO suggests, and the Board decides on new funding programmes. The Foundation always tries to fund strategic areas with big grants that can make a difference in society.

The Foundation has a strategic process every 5th year, where it arranges hearings in different fields to develop new programmes in emerging fields. The CEO of the Foundation is responsible for the process and recommends new programme areas.

B.6 Research Council of Norway (RCN)

The Research Council of Norway	
Country	Norway
Budget	NOK 9.8 billion in 2017
Thematic/disc. focus	Facilitating research and innovation in all disciplines. One specific area of focus currently is strengthening the knowledge base and encouraging research to solve Grand Challenges.
Snapshot description ²⁵	<p>The Research Council of Norway is Norway's national strategic and executive body for research. As such, it advises the Norwegian government and its ministries on research policy, awards project grants for research and innovation activities, and funds institutes. Funding instruments include fellowships, mobility and overseas research grants, infrastructure grants, grants for innovation in the industrial or public sector, seed grants, and support for events.</p> <p>Additional roles of the Council include enhancing the quality of Norwegian research, promoting basic and applied research as well as innovation and sustainability, increasing Norwegian participation in international research and innovation activities, and expanding cooperation between research groups, trade and industry and the public sector. It also provides a platform for dialogue between researchers, users of research and research funders.</p> <p>Headquartered in Oslo, the Council also has regional offices in various parts of Norway as well as a liaison office in Brussels.</p>

Reorganisation of RCN

RCN is in the process of reorganising its structures and some of its processes. The structure was changed in May 2018, but much of the more detailed implementation is still in progress. This account is therefore based on the old structure, but indicates (where known) changes that are in progress.

Since the early 2000s, RCN has been made up of Divisions (one for science, one for innovation, and a varying number of thematic divisions). Each runs several funding programmes. RCN has therefore had three levels of governance. At the top ('steering level 1') is the Executive Board, responsible for strategy and very big project funding decisions. Steering level 2 is the Division Boards. Steering level 3 is the Programme Boards. (The Science Division has disciplinary panels of researchers, with the same function.)

The division boards has an historical background in the previous merger of several national research funding councils and each board has coordinated a significant number of programme activities and policy fields that fall within their thematic and structural responsibilities. Without them, the span of control for the Executive Board would have been unmanageable. To some extent the division boards have approved funding decisions normally made at level 3 and commissioned some of the strategic work that would normally belong at level 1. The four administrative divisions have been reorganised into a larger number of 'areas', removing much of the span-of-control problem. Hence the division boards are to be abolished in 2019, leaving the main board with a large span of control but one that appears essentially manageable and significantly reducing the workload of the administration in supporting and preparing the agendas of the division boards. Further, RCN is now working towards having two levels of steering, where the 4 Division Boards and 52 Programme Boards will be replaced with 15 -25 Portfolio Boards. RCN is simplifying its funding instruments ('application types', in RCN's terminology) from 17 to 7.

An important context is a requirement from government – based on an independent spending review – to cut RCN administrative costs by 10%. The reorganisation is possible because – as a result of the first evaluation of RCN in 2001²⁶ – the law establishing RCN was changed. Until then, the internal organisation was set down in law. It is now the responsibility of the Executive Board.

The low success rate in the open investigator-initiatives compared with a higher success rate in some of the thematic programmes has caused some discussion between RCN and the research community on the priorities of research excellence. RCN expects that with larger thematic portfolios it will be able to reduce the specificity of its calls, making thematic programmes more accessible to bottom-up investigator initiatives. As part of an intended 'portfolio management' of applications and projects, RCN will assess the totality of research investigator applications simultaneously and select projects with overall highest quality. Projects most relevant to the different portfolios will be assigned to and funded by these while the remaining projects will be funded by the "free" pot. This will ensure the highest project quality in all in funded researcher projects. RCN is reducing the number of deadlines for calls per year, in part to align the submission deadlines for investigator-initiated and thematic programmes and therefore make it possible to reallocate proposals among these categories. The number of assessment criteria will be reduced to the three used by Horizon 2020. The number and composition of criteria varies today between the programmes, making it difficult to assess the proposals across different programmes.

²⁵

<https://www.forskingsradet.no/servlet/Satellite?c=Page&cid=1138785841810&pagename=ForskingsradetEngelsk%2FHovedsidemal>

²⁶ Erik Arnold, Stefan Kuhlmann and Barend van der Meulen (2001) A Singular Council: Evaluation of the Research Council of Norway, Royal Ministry for Church, Education and Research Affairs, Oslo, 2001

Structure of the funder

As per the Statutes of the Research Council of Norway, the **Executive Board** is the Council's highest authority. The Executive Board has overall responsibility for the Research Council's activities including its strategy and internal organisation. In terms of awarding funding, the Executive board is only involved in very large funding decisions e.g. centres of excellence, in practice.

The Executive Board is appointed by Royal Decree i.e. the Ministry of Education and Research, for a term of four years. It consists of eleven members with broad insights into research, business as well as social issues, and may have deputy members (currently four). In addition, two elected employee representatives sit on the Board and assist with internal administrative matters. No member may serve more than two consecutive terms.

The research-oriented activities of the council are undertaken within disciplinary and/or thematic divisions.²⁷ Divisions are split into departments which in turn are responsible for a variety of programmes under their remit.

The divisions are overseen by four **Division Research Boards** (Energy, Resources and Environmental Affairs; Innovation; Science; and Society and Health) whose Chairs are appointed by Royal Decree and members are appointed by the Executive Board. Important considerations for appointment are breadth of competence and expertise relevant to the specific board's remit.

The Executive Board stipulates the Division Boards' mandate and procedural rules.²⁷ Members serve for four years and each board has six to ten members. The division boards report to and advise the Executive Board.

Programme Boards oversee individual programmes and are responsible for programme design, composition and proposal assessment.²⁸ In effect, they administer programmes on behalf of the research council and are responsible for designing the work programmes and ensuring efficient implementation of the programmes. Programme Board members are appointed by the relevant division board and depending on the programme can include individuals from academia, industry, politics, civil service or wider society from Norway or Abroad.²⁹ The programme board reports to the relevant Division Research Board via the Director of the relevant Department and the Executive Director of the division. They are appointed by the division boards.

The Council's administration is headed by a **Chief Executive** who serves a six-year term, with the option of one re-appointment.²⁷ The Chief Executive is responsible for ensuring the implementation of the decisions of the Executive Board and heads the administrative side of RCN. The Research Council administration is responsible for the day-to-day operation of the Council at the Central, Division, Department and Programme levels. Each division has had its own director and staff.

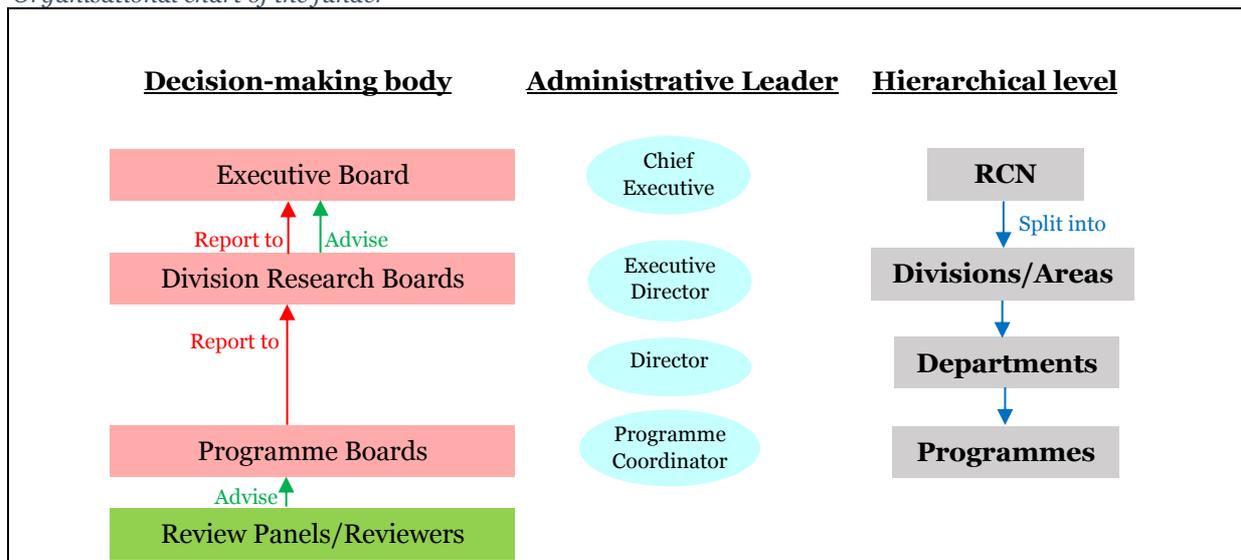
In 2018, at the initiative of the Chief Executive, RCN set up an **International Advisory Board** composed of international experts from academia, industry or science and technology funding organisations advises the RCN on strategic matters. This board is purely advisory; it has no decision-making power.

²⁷ The Statutes of the Research Council of Norway.

²⁸ Arnold E. and Mahieu B. (2012) A Good Council? Evaluation of the Research Council of Norway, Oslo: Ministry of Education and Research

²⁹ Programme plans for programmes including SAMKUL, SAMISK, GLOBVAC and KULMEDIA

Organisational chart of the funder



The funding process:³⁰

Grant applications are normally reviewed by external referees (individually or in panel), whose judgements are passed on to the programme board (or equivalent), which rates and ranks proposals and proposes which should be funded, in accordance with the assessment criteria specified for the relevant application type and/or in the call for proposals. Thus, proposals go through a two-stage process: first, assessment of scientific merit, quality of project leader and other project qualities done by external reviewers; and then the proposals go into the second stage where other considerations will be taken into account. Funding decisions are thus made by a programme board or its equivalent, after considering both the reviewers' recommendations and rankings and – outside the science division – other factors such as relevance to programme objectives.³¹ In the new organisation, the portfolio boards will take final funding decisions based on the assessment of the three new criteria, where also relevance will be included.

An application will usually be reviewed by a referee panel for the subject area, and all proposals shall be reviewed by three referees. The rationale behind this is that panel members working together to get a consensus allows for greater consistency and quality in the review process compared to individual referees commenting on proposals in isolation.

Innovation projects are additionally assessed by the administration for likely socio-economic impacts before the Programme Board takes a final decision.³² Centres and research infrastructure proposals are administered in the part of RCN that has relevant domain expertise, peer reviewed and then prioritised by panels put together specially for that purpose, under the authority of the Executive Board of RCN.

Applicants get feedback, comprising referees' comments or scores allocated in the course of appraisal and have the opportunity to appeal decisions based on administrative issues. They cannot question judgements of quality or relevance.

³⁰ https://www.forskningsradet.no/en/Application_processing/1138882215874

³¹ https://www.forskningsradet.no/prognett-fripro/Nyheter/FRIMEDBIO_allocations_NOK_433_million_to_53_research_projects/1254031880061/p1226994096494; Application review procedure for the joint call for proposals between the BIONÆR, HAVBRUK, MARINFORSK, BIOTEK2021, ENERGIX and SAMKUL programmes on the bioeconomy for 2019

³² Arnold E. and Mahieu B. (2012) A Good Council? Evaluation of the Research Council of Norway.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The Executive Board is appointed by Royal Decree, which effectively means the Ministry of Education and Research. Members are predominantly from academia or industry and cover a broad range of disciplines, institutions and industry sectors. Currently there are 5 academics, 3 from industry and one from a science park, in addition to two employee representatives (one of whom is a very senior research and innovation policy analyst). Currently, four of the nine main members are women.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

Responsibility and oversight cascade from level 1 down to level 3 of the steering hierarchy. All lower-level decisions are therefore visible from one level above. There is no separate inspection or policing.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

RCN has strict conflict-of-interest rules that apply at every board level.

How are panels drawn together? How is suitability decided and ensured?

Expert panels are drawn together by RCN staff. There is no separate quality approval by programme boards on the membership but the decisions are as transparent as possible. Formally, steering level 1 appoints steering level 2; steering level 2 appoints steering level 3; steering level 3 endorse the process of recruiting peer reviewer and panellist recruitment.

For RCN, having overall breadth of expertise in a panel is of utmost importance, as this is seen to provide a sound basis for viewing competing applications in relation to each other.³³

Applicants may recommend external experts as referees or object to the use of specific experts on appropriate grounds.³³ However, RCN is under no obligation to comply with such recommendations/objections. No application will be assessed solely by referees recommended by the applicant(s) normally a maximum of one suggested expert will be used.

How is oversight of the panels' activities and conclusions ensured?

The Division Research and Executive Boards look at the aggregate results of detailed initiatives taken at the division, department and programme level. However, the Boards do not have a separate or independent source of analysis of panels' activities.³⁴

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

The cascade of responsibilities means that scientific quality decisions are in practice taken at level 3, but the composition of boards and panels is approved by the level above in each case.

³³ https://www.forskingsradet.no/en/Application_processing/1138882215874

³⁴ Arnold E. and Mahieu B. (2012) A Good Council? Evaluation of the Research Council of Norway.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

RCN provides all applicants with feedback, commenting on the submitted application's strengths and weaknesses.³⁵ Depending on the type of application, the applicants also receive the comments given by the referees/panels and/or an overview of the marks. Applicants are also able to access names of the referees/panel members who assessed their application after the programme board has reached their funding decision. Under Norwegian law, expert referee assessments barring any specific confidential information may also be accessed by other interested parties on request,³⁵ thus ensuring transparency.

In addition, the RCN has clearly defined rules regarding impartiality in the assessment of grant proposals and offers unsuccessful applicants the opportunity to appeal funding decisions.³⁵

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

In the FRIPRO investigator-initiated research programme, where scientific excellence is the main criteria used to award funding, a panel's recommendations are accepted by the science boards and the panel's ranking is never changed. In thematic programmes, a programme board considers the review panel's ranking, which is based on scientific criteria, in light of non-scientific criteria and adjusts the ranking. Sometimes this consideration is supported by the program coordinators assessments. Even so, the weaker science is filtered out through this process and the programme committee only considers proposals that are of acceptable quality. In theory, these projects could have lower quality than projects funded solely on the basis of scientific criteria but the scores suggest there is very little difference in scientific quality between scientific and thematic programmes.

The Spending Review suggested setting a threshold for scientific quality for funding projects, but this was not felt to be necessary and hence no such threshold has been set.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence?

The RCN boards (Executive, Division and Programme Boards) have confidence in RCN's processes and regard the scientific decision-making as legitimate. The views of the panels are universally accepted. There is no separate legitimacy-check.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Roughly 40% of programme officers have PhDs.

Programming: decision-making and balancing between scientific and extra-scientific considerations

Programmes are formally ordered by the ministries, which allocate earmarked funding to pay for them. Therefore, they are ultimately societal decisions. In practice, the research community and RCN have strong influence on the programmes commissioned. In particular, RCN has an institutionalised dialogue with the ministries about programming and other matters, so to some degree it also communicates the views of researchers to the ministries.

³⁵ https://www.forskningradet.no/en/Application_processing/1138882215874

The recent (and first) Long Term Plan (LTP) was prepared by the Ministry of Higher Education and Research after consultation with the other ministries and a large number of academic panels, which had a profound influence on its contents.

The belief is that the use of academic panels by ministries (as described in the previous section) means that programmes proposed in the plan are scientifically legitimate (anchored in the research community).

Outside the science division (which does not programme thematically), new programmes are designed by committees of academic and non-academic stakeholders. Typically, at least some of those involved will go on to become members of the programme board. Programme boards are responsible for designing the work programmes and implementation of individual programmes.³⁶

³⁶ Programme plans for programmes including SAMKUL, SAMISK, GLOBVAC and KULMEDIA

B.7 Academy of Finland

The Academy of Finland	
Country	Finland
Budget	€444 million in 2018 ³⁷
Thematic/disc. focus	All scientific disciplines
Snapshot description ³⁷	<p>The Academy of Finland is an agency within the administrative branch of the Finnish Ministry of Education, Science and Culture. Its mission is to fund high-quality scientific research, provide expertise in science and science policy, and strengthen the position of science and research. As such, it makes efforts towards the renewal, diversification and greater internationalisation of Finnish research through awarding grant funding for individuals (e.g. professorships, fellowships, mobility grants), research teams (project and programme funding) and research infrastructure.</p> <p>Researcher training and career development and utilisation of research results is also supported by providing funding to the best researchers and research teams as well as the most promising young researchers. Research impact and scientific breakthroughs are important to the Academy and hence it also encourages boundary-crossing and high risk research. The Academy is the main funder of basic research in Finland.³⁸</p>

Structure of the funder

The Board of the Academy of Finland is the highest decision-making body of the Academy, responsible by law for "steering" and "guiding" the Academy. It approves the Academy's strategy and the basic procedures and ensures that the funding instruments are similar across research councils.³⁸ It includes a chair and five to seven members appointed by the Finnish Government for a three-year term.³⁹ The Academy Board allocates funding to the research councils and the Infrastructure Committee as well as the subcommittees.

The Academy of Finland currently has four **research councils**⁴⁰

- Research Council for Biosciences and Environment
- Research Council for Culture and Society
- Research Council for Natural Sciences and Engineering
- Research Council for Health

Each research council assesses funding applications and making funding decisions, monitors the impact and effectiveness of funding, performs operational planning, foresight. By law, the councils work in cooperation with other councils.⁴¹ In addition, the research councils also engage in science and research policy activities and cooperation with national and international funders and stakeholders. According to the new Government Decree on the Academy of Finland, the Research Council for Health will be merged with the Research Council for Biosciences and Environment as of 1 January 2019.⁴²

Each research council consists of a chair and a maximum of ten members appointed by the Finnish Government for a three-year term.⁴² Care is taken to ensure that the research councils represent diverse scientific expertise and depth and breadth of knowledge in the research fields within their remit.⁴³ Before appointing the members, the Ministry of Education, Science and Culture also asks for nominations from

³⁷ <http://www.aka.fi/en/about-us/>

³⁸ Arnold E. et al. (2013) Evaluation of the Academy of Finland. Reports of the Ministry of Education and Culture, Finland 2013:14

³⁹ <http://www.aka.fi/en/about-us/academy-board/>

⁴⁰ <http://www.aka.fi/en/research-and-science-policy/research-councils/>

⁴¹ http://www.aka.fi/globalassets/40akatemia/63_toimikuntajasenien-tehtavankuva-02032018_en_final.pdf

⁴² <http://www.aka.fi/en/research-and-science-policy/research-councils/>

⁴³ http://www.aka.fi/globalassets/40akatemia/63_toimikuntajasenien-tehtavankuva-02032018_en_final.pdf

universities, government research institutes, public authorities and corporate bodies representing research and development, as well as major scientific societies and science academies.⁴² Individuals can nominate themselves for membership.

The Board of the Academy of Finland appoints a number of **subcommittees** to act as independent decision-making bodies for specific purposes.⁴⁴ Currently, there are nine subcommittees of which one is the General Subcommittee that takes decisions on funding for units, strengthening university research (profiles) and Academy professorships. Other subcommittees correspond to specific thematic funding programmes. The subcommittees make funding decisions concerning calls that come under the responsibility of several Academy research councils..

The Academy Board defines a subcommittee's tasks and appoints its chair, vice chair and other members. A subcommittee may include only chairs or members of the Academy Board, the research councils, the Finnish Research Infrastructure Committee and the Strategic Research Council. A subcommittee's term ends at the latest when the term of the Academy Board ends.

The **Finnish Research Infrastructure (FIRI) Committee** monitors and develops Finnish and international research infrastructure activity, provides funding to infrastructure projects and monitors those funded projects.⁴⁵ It has 15 members, a chair and a vice-chair.

The **Strategic Research Council (SRC)** provides funding for long-term and programme-based research aimed at finding solutions to the major challenges facing Finnish society.⁴⁶ It designs funding programmes and funding calls, decides which projects to fund, and monitors their progress and impacts. The main themes of the research programmes are decided annually by the Finnish Government following recommendations from the SRC.⁴⁷ The SRC consists of eight members (from academia and industry) and a chair appointed by the Government for a three-year term.

By law, the **president** of the Academy leads the Academy, supported by two **vice presidents**, one for overseeing the Academy's administration and one for science policy planning and development of research funding. The **Administration Office** does all the necessary groundwork (see funding process) for official decision-making by the Academy Board and research councils, and implements their decisions.⁴⁸ It also prepares science policy surveys and plans and participates in Finnish and international working groups.

The President is appointed by the Government for a maximum of five years.⁴⁹ S/he leads the Academy and represents it outside. The President must be a distinguished scientist or scholar with proven management experience and skills, for example, in science or university administration.⁴⁹

⁴⁴ <http://www.aka.fi/en/about-us/subcommittees/>

⁴⁵ <http://www.aka.fi/en/about-us/finnish-research-infrastructure-committee/>

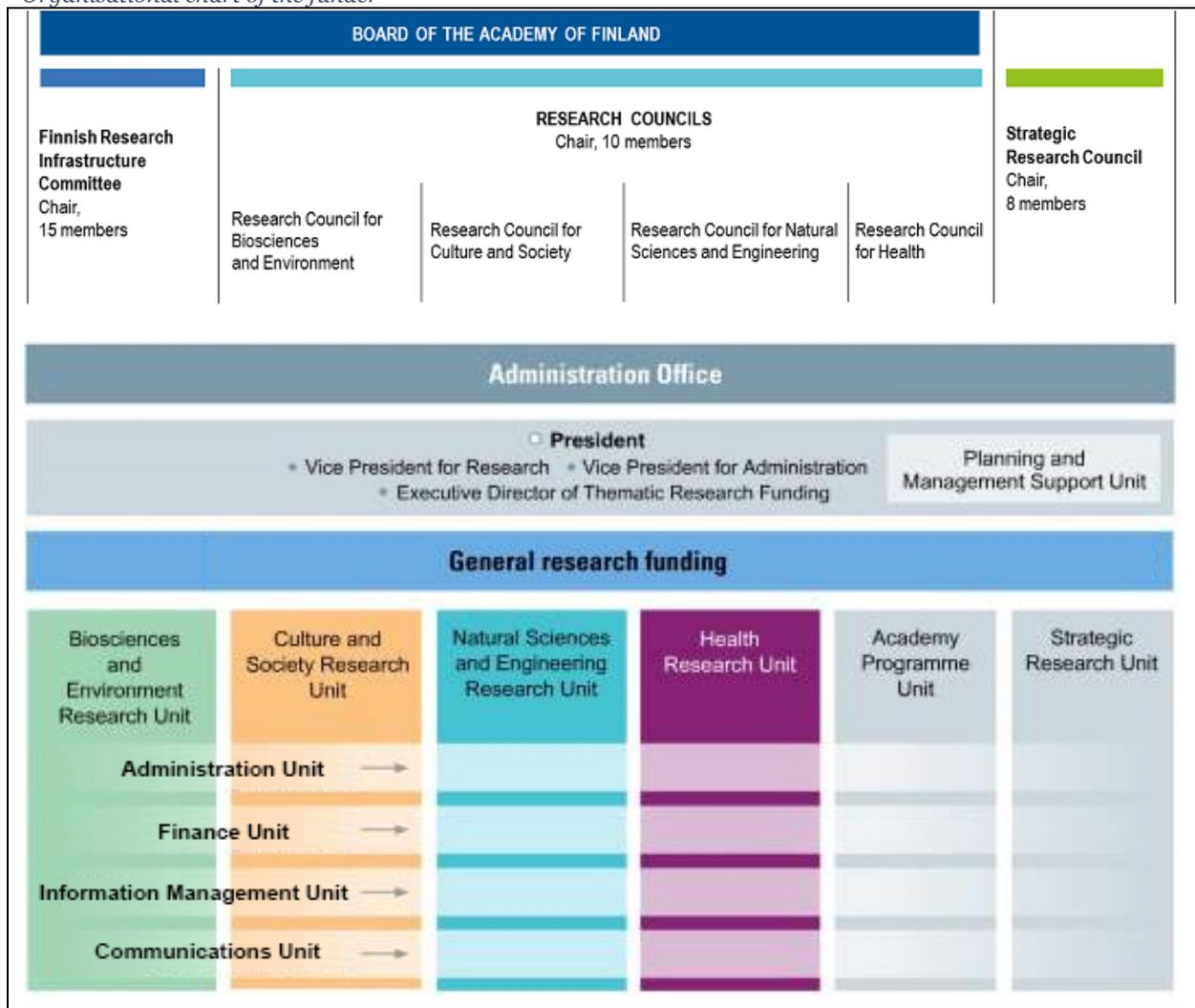
⁴⁶ <http://www.aka.fi/en/about-us/SRC/>

⁴⁷ <http://www.aka.fi/en/strategic-research-funding/src-in-brief/>

⁴⁸ <http://www.aka.fi/en/about-us/administration-office/>

⁴⁹ Arnold E. et al. (2013) Evaluation of the Academy of Finland. Reports of the Ministry of Education and Culture, Finland 2013:14

Organisational chart of the funder⁵⁰



The funding process:⁵¹

Funding is allocated on a competitive basis and international peer review is the Academy’s key tool for identifying the best and most promising research projects. Grants are usually from three to five years.

How applications are processed and reviewed depends on whether they are submitted in a one-stage or two-stage call. For example, Academy Project applications are one-stage calls, whereas most Academy Programme applications are two-stage calls. A two-stage call will include a pre-proposal stage where proposals are checked against eligibility criteria or may even go through an initial peer review. Applicants whose proposals make it through the pre-proposal stage will be invited to submit a full proposal.

Applications for multi-year funding require a written review from an international expert panel or at least two external experts. Panel members have access to all applications assigned to the panel, barring any that present conflicts of interest. Each application is assigned to at least two panel members who prepare preliminary review reports for discussion with the other panel members. The panel discusses

⁵⁰ <http://www.aka.fi/en/about-us/organisation-chart/>

⁵¹ <http://www.aka.fi/en/about-us/academy-of-finland-in-brief/>

all the applications and corresponding preliminary review reports at a meeting and prepares one joint review per application.

A science adviser or programme manager from the Academy is responsible for processing the applications and also helps the review panel to discuss the proposals. S/he tries to ensure that evaluation level is even across all applications, all criteria are looked at, and rankings are applied similarly across different panels. S/he also summarises the procedures and findings of the review panel for the decision-making body which can be a research council, the Strategic Research Council, the Finnish Research Infrastructure Committee or a subcommittee.

Decisions are primarily based on the scientific merit and feasibility of the research plan and the competence of the applicant/s as well as the policy objectives of the Academy such as impact, renewal of Finnish research and interdisciplinary, internationally oriented or phenomenon-based research. Other factors include whether the proposal will facilitate open access, development of research environments including of infrastructure and early career and female researchers, evidence-based policy or decision making and/or societal impact.⁵² The number of projects funded and the amount of funding allocated depend on the budget available. The Academy Board has no intervention power over decisions taken by the research councils and other committees.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The Government appoints members to the Academy's Board and research councils. The Academy itself has no role in the selection. Members are recruited on the basis of high level and wide range of scientific expertise. Candidates are nominated by their institutions, and they can also nominate themselves. Considerations for appointment include balance of gender (at least 40% of each gender), major disciplines and non-academics with a research background (e.g. from NGO or industry).

Before appointing the members to the research councils and Academy Board, the Government also asks for nominations and views from universities, government research institutes, public authorities and corporate bodies representing research and development, as well as major scientific societies and science academies.⁵³

In addition to the Research councils, the FIRI Committee and SRC, funding decisions are also made by subcommittees appointed by the Academy Board. The subcommittees consists of members of the Academy Board, research councils, the strategic research council or FIRI Committee.⁵⁴ The subcommittees decide on funding for Centres of Excellence and specific instruments. For multidisciplinary proposals that fall outside thematic programmes, proposals seen by relevant RCs separately.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

No. The Academy Board does not have oversight or intervention power over research council decisions.

⁵² <http://www.aka.fi/globalassets/42julkaisut/processing-and-reviewing-2018.pdf>

⁵³ <http://www.aka.fi/en/research-and-science-policy/research-councils/>

⁵⁴ <http://www.aka.fi/en/about-us/subcommittees/>

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

The Academy of Finland sees good governance as well as clear and transparent procedures as essential to achieving a fair, consistent and reliable operation.⁵⁵ To ensure the objectivity and impartiality of individuals involved in decision making, the Academy observes the disqualification provisions of the Administrative Procedure Act. This means that any members with a potential conflict of interest in relation to a specific decision or proposal are disqualified from proceedings. It applies to Academy Board and Research Council members as well as peer reviewers. Civil servants (administration) will do the necessary checks (e.g. based on publication lists), but individuals are also required to declare potential conflicts of interest themselves as well.

Research council and committee members who are responsible for funding decisions are not granted Academy research funding during their term.

How are panels drawn together? How is suitability decided and ensured?

The administration draws together a review panel of almost solely foreign peers from esteemed researchers in the field in question.⁵⁶ In some cases, an application may be sent to a specialist who is not a member of the panel but who may provide additional knowledge pertaining to a particular field.

Potential choices for panel members are also discussed with sister organisations in other Nordic countries. Panellists who do a good job are invited again. However, they are typically not repeated for more than 2 years to avoid any bias creeping in.

How is oversight of the panels' activities and conclusions ensured?

Councils look at each proposal themselves. Although the main determining factor for decisions is the panel's report, the Council can overrule the panel's report. For transparency, the council also writes its own report explaining why they took the decisions that they did.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

Applications are usually reviewed by panels rather than individuals. At least two panel members or external referees will conduct an in-depth review of an application. Experts with specific subject expertise may be invited to review a proposal if panel members require additional input. The panels' reviews are considered for the final funding decision by the relevant decision-making body in the context of other policy-related factors. For example, in the councils, the councils make the funding decisions – the panels rate but the councils fund. With very few exceptions all funded proposals have received a grade of “outstanding” or “excellent” from the panels, but not all proposals with such reviews can be funded.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The Academy believes that international peer review and open competition allows it to support the best researchers and research teams.⁵⁷ International peer review allows proposals to be matched against

⁵⁵ https://www.aka.fi/globalassets/40akatemia/63_toimikuntajasenentehavankuva-02032018_en_final.pdf

⁵⁶ <http://www.aka.fi/en/review-and-funding-decisions/how-applications-are-reviewed/review-panel-meeting/>; Arnold E. et al. (2013) Evaluation of the Academy of Finland. Reports of the Ministry of Education and Culture, Finland 2013:14

⁵⁷ <http://www.aka.fi/en/about-us/academy-of-finland-in-brief/>

international quality standards. Moreover, peer reviewers and members of the various decision-making bodies are selected on the basis of being esteemed researchers in relevant fields.

In effect, the whole process of awarding funding is important, particularly:

- High quality of reviewers/councils – Having high quality researchers who are able to give enough time to the review and have the ability to look widely into the research field (not just in own area of research)
- Good quality of reports
- Transparency/openness including clear criteria for applicants, letter to researcher about why a certain decision was made

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

Scientific quality is the most important criterion for making funding decisions, even though impact both in and outside the scientific field is also an important factor.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence?

Decision-making bodies see presentations and written summaries from the presenting officer (from the administration) regarding the procedures and findings of the review panel.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Most have PhDs, and an increasing number of them also have postdoctoral experience.

Programming: decision-making and balancing between scientific and extra-scientific considerations

Programmes are approved by the Academy Board. Last time, all scientists in Finland were asked to submit ideas for programmes through an open call. These ideas were discussed and ranked by the Academy, and now 10 programmes based on those ideas have been funded. The programmes cover interdisciplinary topics, cross-council issues and novel areas that need to be built up. Program volume has in recent years been less than 10 % of the total funding of the Academy.

The programming process has several stages:

- Firstly, suggestions are collected from scientific and non-scientific stakeholders using different mechanisms e.g. brainstorming sessions like “learning café”
- A list of possible programmes is prepared based on the suggestions collected and the research community is asked to comments on this list
- The Academy Board considers all comments and makes decisions. It employs different criteria, e.g. added value of the programme to society or whether it boosts a new area

The actual programme design is undertaken by a committee of 6-10 members appointed by the President (half research council members, half researchers from the relevant field). Committee members cannot apply for funding from the programme they have designed. There are no bodies/people with oversight and intervention power.

B.8 Natural Environment Research Council UK (NERC)

The Natural and Environmental Research Council (NERC)	
Country	United Kingdom
Budget	£580,575,000 in 2017-18 (£502,730,000 in 2016-17) ⁵⁸
Thematic/disc. focus	Environmental science
Snapshot description	<p>The NERC is a corporate body with executive responsibilities set up under the Science & Technology Act 1965 and by Royal Charter. It is part of UK Research and Innovation (UKRI), a new organisation established by The Higher Education and Research Act (2017)⁵⁹ that (as of 1 April 2018) brings together the seven UK research councils, Innovate UK and Research England to establish nine councils, each with their own fields of activity and led by an Executive Chair.</p> <p>NERC invests in the environmental science discipline in its widest sense through research and innovation programmes (traditional moulds of research grants, postgraduate training, fellowships, capital funding, innovation funding and response mode [discovery science]). NERC also supports six UK research centres through ‘National Capability Funding’:</p> <ul style="list-style-type: none"> • British Antarctic Survey (BAS) • British Geological Survey (BGS) • Centre for Ecology & Hydrology (CEH) • National Centre for Atmospheric Sciences (NCAS) • National Centre for Earth Observation (NCEO) • National Oceanography Centre (NOC)

Reorganisation of NERC and UK Research and Innovation (UKRI)

As of April 2018, a major reorganisation has taken place in the UK research funding system, including at the highest level through the creation of UK Research Innovation (UKRI, of which all UK Research Councils (including NERC) as well as the funding council Research England and the Innovation agency InnovateUK are part. Likewise, structures have been re-organised within the individual Research Councils, including several changes that are still pending or under discussion. This account therefore reports on the new structure as much as possible, but also draws on parts of the old structure, some of which may be subject to change.

Structure of the funder

NERC is one of the funders that have been brought together under the umbrella of **UK Research and Innovation (UKRI)** (as of 1 April 2018). UKRI now oversees the seven UK research councils, Innovate UK and Research England (which provides institutional funding to universities) to establish nine Councils, each with its own fields of activity and led by an Executive Chair. Each Executive Chair is supported by a Council of up to 12 members, as is the case for NERC.

NERC’s organisation is as follows⁶⁰.

- NERC’s ‘parent’ organisation **UKRI** sets overall priorities. The specific priorities within each of the funding councils within UKRI are in the process of being defined. There is funding for grand challenges, innovation, strategic and basic research. A significant proportion of that funding is channelled through the discipline-specific research councils, which are the main commissioning

⁵⁸ This is both programme and resource budget combined –the entirety of this budget is not spent on funded research and innovation, but includes staff costs/overheads etc. Research and Innovation funding budget alone is around £240m per annum. See also: <https://nerc.ukri.org/latest/publications/strategycorporate/annualreport/annualreport/>

⁵⁹ <http://www.legislation.gov.uk/ukpga/2017/29/contents/enacted/data.htm>

⁶⁰ This description focuses on research funding, omitting normal administrative functions such as finance, human resources and so on as well as the Audit and Risk Assurance Committee

bodies. When they do so they use the Haldane principle, which stipulates the independence of funders from government in making funding decisions.⁶¹

- **UKRI** appoints the **NERC Council**, which is the highest decision-making body in NERC
 - The **Science Board** reports to the NERC Council, advising it on matters of science policy. The Science Board is in turn advised by a **Strategic Programmes Advisory Group**
 - A **Training Advisory Board** also reports to the NERC Council
 - An **Innovation Advisory Board** advises the NERC Council, through the Director of R&I in the NERC Head Office
 - A **Joint Capital Advisory Group** advises the NERC Council on capital spending priorities
 - The **NERC/British Antarctic Survey Operations and Safety Assurance & Advisory Group** advises on risks and safety in Antarctic research
- The administration is led by the **NERC Head Office**, comprising an **Executive Chair**, Chief Operating Officer, Director of Research and Innovation and a Director of Corporate Affairs. In addition to running the NERC administration, the Executive Chair chairs meetings of the NERC Council – but is not a member of that Council.
 - Three types of committee report to the NERC Head Office
 - The **NERC Management Board**
 - Six **Centre Advisory Boards**, one for each of the major research facilities managed by NERC
 - The **National Capability Partners’ Forum**, which lets the Centre directors collaborate and coordinate across the NERC estate
 - The **NERC administration** also reports to the NERC Head Office

The **NERC Council** has ten appointed members, including one Senior Independent Member and one Chief Scientific Advisor. Members come from NERC's academic and user communities. The Executive Chair chairs the Council. The COO, Director for R&I, and Director for Corporate Affairs (see NERC Head Office) attend Council meetings. They represent research and innovation across higher education, industry and commerce, policy and/or civil society and are appointed in accordance with Cabinet Office guidance⁶² that requires that appointments are based upon merit through a fair and accessible recruitment process. The NERC Management Statement (2005) states that the Chair should attempt to ensure “a proper balance of members from the academic and user communities and government.”⁶³ The Council’s role is to support the NERC executive and make decisions delegated to it by UKRI, including: budget prioritisation, ensuring the future of individuals in the NERC community to support UK R&I capacity, engaging with the NERC community to support and develop their ideas, and encouraging collaborative work across UKRI councils. The Council is advised by the Science Board and several advisory boards.

- **Science Board (SB)** (Thirteen appointed members and one Chair) advises the NERC Council on all science and innovation matters including NERC’s strategy, the balance of the science portfolio, new programmes, and on the business of each of the advisory bodies. It is formally advisory but its recommendations are very influential. There is an open recruitment process (as there is for all NERC boards)

⁶¹ See <http://www.legislation.gov.uk/ukpga/2017/29/section/103/enacted>

⁶²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/411262/10032015_Departmental_Guidance_2015_PDF.pdf

⁶³ http://www.nerc.ac.uk/about/organisation/boards/mgt_statement05.pdf

- NERC uses five advisory boards to advise and hold the Council to account according to the goals in the NERC strategy: 'The Business of the Environment'.⁶⁴ The chairs of IAB, JCAG, and TAB are invited observers at NERC council meetings

Innovation Advisory Board (IAB) – advises NERC council on translating R&I investments into impact and economic growth. It has 18 appointed non-executive members (one chair). This includes members from government, civil society and industry sectors

- **Joint Capital Advisory Group (JCAG)** – advises NERC Council on capital priorities. It has one chair and eight members. from SB, SPAG, TAB, IAB and members from universities and research centres. Members appointed for one year (maximum of two terms)
- **NERC/BAS Operations and Safety Assurance & Advisory Group (NBOSAAG)** – Antarctic operations and safety. It has one chair and five appointed members, including the NERC COO, government representation, NERC non-executive director, research institutes and private companies related to BAS activities
- **Strategic Programme Advisory Group (SPAG)** – advises the Science Board on research opportunities, providing an interface between NERC and researcher community. It has one chair and thirteen appointed members who are experts in NERC topic areas from researcher and user communities. They are appointed for one year (maximum of 3 terms). Strategic research is 20% of the NERC budget and is defined by a community-driven ideas process that involves academics, policy makers, companies and the voluntary or not-for-profit ('third') sector. At various points in the year SPAG will review and present the best ideas for review by the Science Board, which provides recommendations to establish activities to the executive that are usually accepted
- **Training Advisory Board (TAB)** – advises NERC Council and the Executive on the strategic direction and success of training investments. TAB contributes to peer review of doctoral/non-doctoral training funds. Members act as an interface between NERC and its communities. It has a chair and fourteen appointed members. Membership comprises a mixture of senior academics, early career researchers and end-user representatives

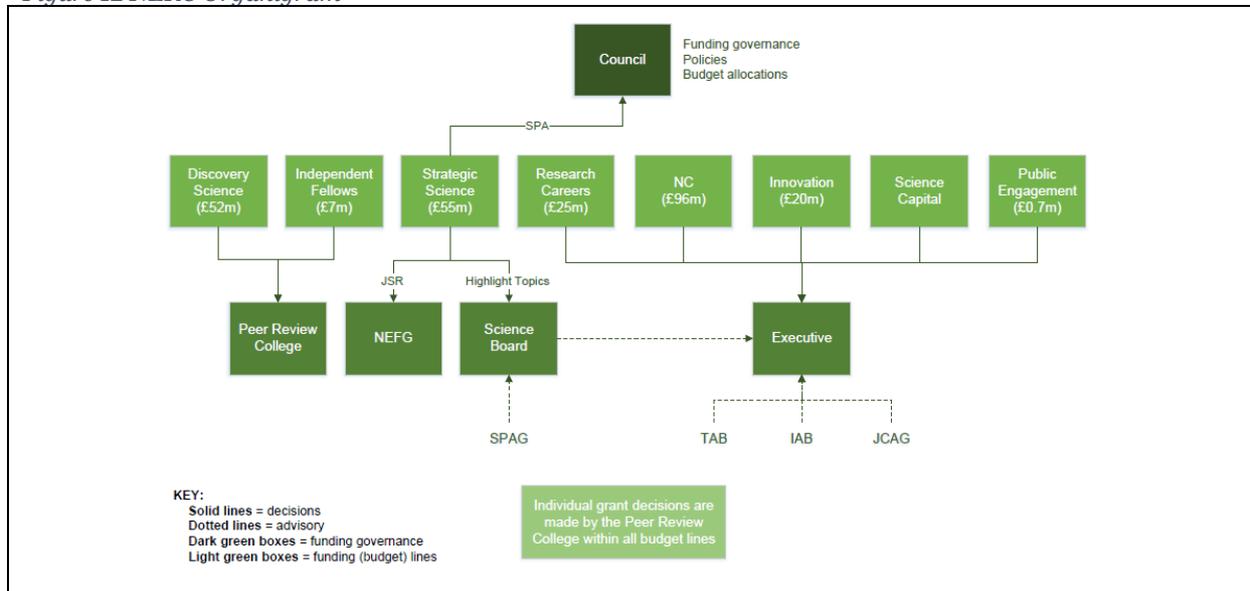
The **NERC Executive** is responsible for the leadership, strategy, planning, performance management, reporting and external relations of NERC. These are four corporate positions that deliver on those responsibilities as a collective: the **Executive Chair**, COO, Director of R&I and the Director of corporate affairs. It is in charge of the administration and is advised by a number of Boards.

- The head office teams (administration) are responsible for developing NERC policy and administering funding, as well as providing operational support (finance, IT, HR, communications, estates). The Head Office has several research funding departments (each headed by an Associate Director and answering to the Director of R&I). Each theme can be sub-divided into areas (led by area heads), which plan and manage programmes (led by programme managers)
- **NERC Management Board (NMB)** (seven fixed-role members and the NERC Executive Chair as chair) Membership is: the NERC chief executive, NERC COO, Directors of Research and Innovation, and corporate affairs, associate director of strategy and evidence and two NERC non-executive directors. NMB is responsible for developing and administering NERC Councils' strategies and policies and ensures NERC is managed with accountability and efficiency.
 - **Six Centre Assurance Boards (CABs)** Membership is: NERC Executive Chair, NERC COO, Centre directors and senior managers, the NERC director of Research & Innovation (as appropriate), NERC finance director, NERC associate director of HR (when appropriate), NERC Director for projects and programmes. Centre Assurance Boards report to the NERC Management Board. CABs provide a forum to review the comprehensiveness and reliability of assurances on governance, risk management, the control environment and financial statements for the research centres.

⁶⁴ NERC (2013) "The business of the environment" <https://nerc.ukri.org/latest/publications/strategy/corporate/strategy/the-business-of-the-environment/>

- **The National Capability Partners' Forum (NCPF)** – this body provides a forum for Centre Directors and senior management to share practice and collaborate on cross centre activities as necessary.

Figure 12 NERC Organigram



Source: NERC

The funding process:

All grant applications must be submitted using the research councils' Joint Electronic Submission system (Je-S).⁶⁵ The same principles of assessment apply to all components of NERC funding and all proposals are peer reviewed with some variable processes per scheme. Most schemes' proposals are assessed in two stages, after NERC staff check for eligibility.

(1) External peer (expert) review. Reviewers are generally international experts in topics relevant to the proposal and all response-mode proposals are reviewed by peer review.⁶⁶ Three peer review colleges organised into disciplines or themes can be used to select willing reviewers. College members generally respond positively to requests to review proposals. Applicants may also nominate reviewers and can respond to reviewer comments. The number of reviewers per project range from two to six, depending on which funding instrument is being used.

(2) Moderating Panel – there are panels for 'response-mode' grants and 'research programmes'. The former comprise members from the peer review college with a chair,⁶⁷ and the latter only some college members along with UK and international experts and no chair. (Both memberships are made public). Panels are chaired by external academic experts with oversight and input from the member of the administration (typically whoever is directly responsible for the scheme). Panels use the external review results and provide scores for research excellence, fit to scheme (in some cases) and the credibility of the pathways to impact proposed by the applicant. They then produce a ranked list of proposals using the research excellence (and sometimes fit to scheme / impact) score. The discussions per proposal are summarised and used as applicant feedback.

⁶⁵ <https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx>

⁶⁶ <https://nerc.ukri.org/funding/application/peerreview/>

⁶⁷ <https://nerc.ukri.org/funding/application/peerreview/college-chairs/>

Small investments and outline proposals are panel-assessed only and proposals assessed during ‘sandpits’ are peer reviewed in real-time.

Panel decisions are advisory. Formal funding decisions are taken by a member of the administration – an assistant director or senior programme manager – using ‘delegated authority’ from the Executive.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The Executive is the high-level decision-making body in terms of setting up new programmes or investments. The people who actually decide on whether proposals are funded are administrators, using authority delegated from the Executive, are typically associate directors or senior programme managers.

NERC Council advises the executive. Between October 2017 and January 2018, NERC recruited a new council for the changeover to UKRI.⁶⁸ Existing members of the NERC Council were encouraged to apply in competition with new applicants. The UKRI board appointed the new members after a two-stage application process (formal application and interview) whereupon a balanced membership is selected by the panel and recommended to UKRI via the Executive. The panel membership comprises the NERC Executive, the UKRI CEO and one independent member.

Currently there are Council members from research and innovation across higher education, industry and commerce, policy and/or civil society. The Council is made up of several high profile researchers in environmental science, a public engagement specialist for a charity, a governance expert with high level government experience, an entrepreneur in the energy sector, former chief scientist at the Met Office, a former UK politician working in climate matters and a former NERC Centre director as Chief Scientific Advisor representative.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

Not outside the hierarchy described above.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

A register of declared interests is published on the NERC Council membership web page⁶⁹ detailing members’ conflicts of interest, if applicable. Detailed descriptions of the backgrounds of each member are also given on the page, which may also contribute to this transparency. NERC Council meeting agendas and summaries⁷⁰ are published, both from meetings of the current Council (formed as UKRI was formed) and the Legacy Council (before UKRI was formed) going back as far as 2014.

How are panels drawn together? How is suitability decided and ensured?

The Peer Review College is used as a resource from which to assemble panels – in some cases exclusively, in others in part. Other panel members tend to be external experts in the research being assessed.

Panels are usually drawn together by administrative staff. Programme managers identify potential panel members and external reviewers and these may be approved by an associate director. Panels are assembled by making a long list of academic and end-user expertise from a database of previous members. This is trimmed down to a shortlist. In the meantime, a panel chair is identified who helps advise on the panel members.

⁶⁸ <https://nerc.ukri.org/about/organisation/boards/council/vacancies/application-pack/>

⁶⁹ <https://nerc.ukri.org/about/organisation/boards/council/membership/>

⁷⁰ <https://nerc.ukri.org/about/organisation/boards/council/legacy-council/meetings/>

One of the biggest challenges is finding peer reviewers. Only around one in seven agree to a peer review request.

How is oversight of the panels’ activities and conclusions ensured?

Panel outcomes (including rank, score and the funding cut-off), previous awards and success rates are routinely disclosed on the NERC website,⁷¹ which helps to provide accountability and transparency to the assessment processes. Programme managers are responsible for drawing together information that supports a panel, e.g. chair’s notes and running order. They attend panels and are responsible for the policy aspects including conflicts of interest. Depending on the nature of the investment the ‘head of area’ might attend a panel as well, since she or he has delegated funding authority. Ultimately, the panel has no decision making power as such, their role is only advisory: it is the Executive that makes the final decision through delegated authority.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

Only the external peer reviewers and the panel members judge scientific quality. The external reviewers are the first to assess scientific quality, which they do in depth and provide a score (0-6) and comments. Two panel members then present each paper and two ‘readers’ are assigned to read each proposal within the panel. Thus four members will thus have read each proposal, reviewer comments and any PI response to the peer reviews in some detail. The proposal is then discussed at panel in its entirety before an overall research excellence score is assigned to it (0-10). Proposals are then ranked based upon research excellence.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The external peer review and panel review are the most important, both from the perspective of the research community and from the staff within NERC. However, this is where challenges to legitimacy can occur: applicants can challenge elements of the process and a small number of cases are escalated to associate director level.

The selection of reviewers is also an important part of the process. NERC draws mostly on its community for external reviews and goes further afield to international experts as needed. The programme managers are in charge of reviewer selection and approval. This is labour-intensive and so there have been calls to consider whether a more automated system could be used.

An ‘executive member’ (usually a head of area or associate director) attends panel meetings to ensure the process of selection is fair and that conflict of interest policies are adhered to. The summary of the panel’s discussion of each proposal is used as feedback to applicants and as a record of the justification for the panel scores and decisions.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

Research excellence and ‘fit to scheme’ are the key criteria across all NERC funding schemes. While reviewers and panellists comment on the other dimensions, overall research excellence is usually the only criterion to receive a score. In a few cases, fit to scheme will also receive a score.

The innovation function does not have a scientific peer review process in the panel process because it is understood that the research on which it is based has already been through a peer review process. The

⁷¹ <https://nerc.ukri.org/funding/application/outcomes/>

job of the innovation projects is to fund the translation of scientific outputs into tools, processes and systems to meet the needs of end-user communities. The innovation criteria focus on potential for impact and on feasibility.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence

Who makes the final decision on project funding depends on the value of the investment overall. Typically, an associate director will approve funding. The associate director will only exceptionally request specific materials from proposals, for example if there has been a problem in the process. However, the associate director will not question the panel's judgement of scientific quality.

To improve the quality of the review processes and decrease unconscious bias, NERC has made changes to the moderating panel process⁷². Currently

- Some panel meetings are held over two days, allowing more time for discussion and for the final ranking.
- Two 'readers' read each proposal and two 'introducers' present each proposal meaning that at least four members have read the proposal, the associated reviewers comments and the principal investigator response in detail.
- Each of the readers are asked to give their comments on the proposal first, then the panel move onto scores.
- The scoring criteria are published in advance of the meeting and the assessment panel Chair stresses the importance of using these at the start of the meeting.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Generally, administrators working with research funding have PhD degrees. (This is less the case for innovation programmes.) The former requirement for all programme managers to have PhDs has been waived, on the argument that even though a PhD is useful, extensive experience of programmes and council experience is critical. PhDs are nonetheless still valued.

Programming: decision-making and balancing between scientific and extra-scientific considerations

A decision to launch a new programme or major investment or funding is built via an initial business case. The community-facing heads of area are in charge of the research team, innovation team, partnerships team, national capability team and research careers teams. The heads lead the strategic development of programmes overseen by the responsible associate directors, using scoping and development workshops, then develop the programme operationally.

'Strategic research' is a helpful example accounts for 20% of the NERC budget. Priorities are defined by a bottom-up, community-driven process, involving academics, policy makers, companies and the third sector. At various points in the year there is a cut-off point where the SPAG reviews and works up the best ideas for review by the science board. The Science board recommends a set of programme areas for further development.

⁷² <https://nerc.ukri.org/funding/application/assessment/>

The budget holder for R&I is the director of R&I. The budget for a new initiative is signed off by the senior leadership team, which involves the director for R&I and four associate directors. The Executive Chair can overrule this decision.

The main mechanism for ensuring scientific legitimacy in programming is in effect the recommendation by the Science Board.

B.9 Netherlands Organisation for Scientific Research (NWO)

Netherlands Organisation for Scientific Research (NWO)	
Country	The Netherlands
Budget	€914 million in 2016 ⁷³
Thematic/disc. focus	All scientific disciplines and fields of research
Snapshot description	<p>NWO is an independent directive body with a legally established mission and tasks. It falls under the responsibility of the Ministry of Education, Culture and Science. With effect from 1 January 2017, NWO underwent some restructuring to make the governance and organisation more streamlined and coherent.</p> <p>NWO's main task is to fund scientific research at public research institutions in the Netherlands, especially universities. Funds are allocated competitively on the basis of quality, and independent assessment and selection procedures.</p> <p>While it has to operate within the constraints imposed by the government, NWO is free to organise its instruments. NWO allocates grants for individual projects, programmes, cooperation and exchange as well as research facilities. In addition to allocating research funding, NWO is also involved in developing programmes; promoting research connections between science and business, disciplines and nations, supporting open access in terms of publishing and data, helping researchers to organise themselves and influencing national and European science policy. There are specific funding instruments for foreign applicants, young researchers, minorities and women.⁷⁴</p>

Structure of the funder

The **Executive Board** is the most senior administrative body within NWO and consists of a President, a Chief Financial Officer (CFO, the only non-scientist) and the four chairs of the NWO Domains. The NWO Executive Board is supported by an Executive Board Office. The president and members of the Executive Board are appointed by the Minister of Education, Culture and Science for a period of five years, and may be reappointed once. The President and CFO are employed full time while the Domain Chairs are part-time (0.5 FTE).

The Executive Board is responsible for the integral strategy, programming and budget allocations across the NWO domains. The Executive Board also determines the long-term core budgets for the institutes. Placing these responsibilities with the Executive Board is expected to enable NWO to position itself more strategically, to increase its decisiveness and organisational capabilities, to deploy funds more flexibly, and to have more coherent programming. Crucially, it ensures that the scientific management procedures work well, for example by checking the composition of review panels and that the processes are being followed correctly.

In the recent NWO re-organisation, the previous roles of the chairman of the Executive Board and Chief Executive Officer have been combined into the single role of the President. The President is supported by a central administration that coordinates strategy, legal matters, HR, finance and communications functions with counterparts in domains.

An independent **supervisory board** of leading individuals from politics, civil service, and society (i.e. clients of NWO) is planned to allow oversight over the Executive Board. However, the exact composition and role/responsibilities of this body have not been decided yet. In addition, there will be an **advisory board** of individuals from academia and industry who will advise on the more scientific aspects of NWO's work.

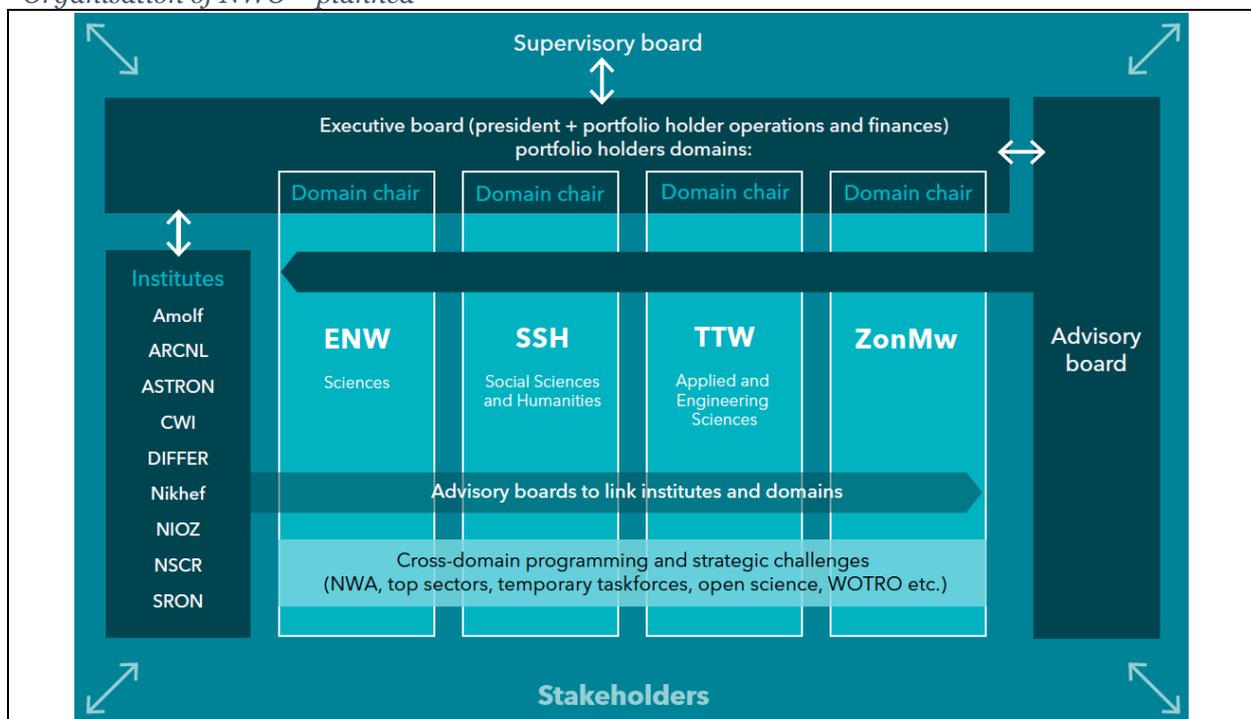
⁷³ NWO Annual Report 2016. Available at: <https://www.nwo.nl/en/about-nwo/media/publications/nwo/annual-report-2016.html>

⁷⁴ <https://www.nwo.nl/en/about-nwo/organisation>
<https://www.nwo.nl/en/about-nwo/what+does+nwo+do>

NWO's core tasks are performed within the NWO domains, research institutes and task forces.

- With effect from 1 January 2017, NWO was reorganised from nine to **four domains** – Applied and Engineering Sciences, The Netherlands Organisation for Health Research and Development (ZonMw), Science, and Social Sciences and Humanities. Programming and allocation of research funding is also undertaken at the domain level. Each domain is led by a board and the chair is also a member of the Executive Board.
- The previous structure (before reorganisation) included around 19 independent areas (along disciplinary lines) with their own boards. Not all areas worked well and interdisciplinary areas like neuroscience were badly served. The administrative structure of the old areas has been incorporated into the new structure e.g. there was previously a separate Chemical Sciences area which is now part of the Science Domain. In addition, the separate area boards have given way to a single Domain Board. The new set-up allows NWO to run multidisciplinary programmes as easily as monodisciplinary ones.
- Each domain has a Director who is a civil servant who heads the administration function (programming, panel selection, communication, etc.) and has executive and management powers. S/he heads an administrative hierarchy comprising subject area directors followed by programme managers.
- Most of the funding decisions are taken at the domain level. The Domain Board (and chair) has the decision-making power. Panels are selected by programme managers. There are separate panels for assessing scientific merit and for assessing potential applications of the research or societal impact.
- **NWO research institutes** undertake research.
- **Taskforces** are temporary units with a special focus on a single, often multidisciplinary, field of research. Current taskforces are the National Initiative on Brain and Cognition, the Netherlands Initiative for Educational Research and the National Taskforce for Applied Research.

Organisation of NWO – planned⁷⁵



⁷⁵ Connecting Science and Society. NWO strategy 2019-2022. Available at: <https://www.nwo.nl/en/documents/nwo/strategy/nwo-strategy-2019-2022>

The funding process:⁷⁶

Grant applications are assessed against selection criteria described in the relevant call for proposals. Pre-proposals may be requested if NWO expects a high volume of proposals for a particular call relative to the budget available. In these cases, a full application will be accepted only if the pre-proposal has been successful.

For most instruments, grant applications are assessed by external peer reviewers if they meet the specified eligibility criteria. All applicants are given the opportunity to respond to the referees' assessment. This rebuttal is an important element of the assessment process.

All the proposals, referees' reports and applicants' rebuttals for a funding instrument are made available to a specially appointed selection committee or jury for comparison and review. Committee members normally assesses proposals collectively in a meeting, while jury members assess the proposal individually and do not meet. The committee/jury may also ask for an interview or site visit to get further information. The committee then collectively assesses all the proposals and gives each a mark based on which it issues funding recommendations to the relevant decision-making board which can be the Executive Board, a domain board or a body mandated by the Executive or domain boards. Usually the board adopts the selection committee's advice and makes the final funding decision accordingly.

Applicants are formally informed of the board's decision and the reasons underlying it. Applicants can appeal against the decision through the NWO's independent Appeals and Objections Committee.

To minimise the burden on external referees, NWO may ask the selection committee to pre-select proposals if more than four times the proposals as can be funded are received. The idea is to ensure that referees only see proposals that have a good chance of being successful.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

The president and members of the Executive Board are appointed by the Minister of Education, Culture and Science. The Board includes a Chief Financial Officer and the four chairs of the NWO domains. The current President and domain chairs are all academics.

The current President, Professor Stan Gielen, was appointed after an open recruitment procedure and subsequent nomination by an appointment committee.⁷⁷ Once the joint works council of NWO, ZonMw, Centrum Wiskunde and Informatica (CWI), Royal Netherlands Institute for Sea Research (NIOZ), Foundation for Fundamental Research on Matter (FOM) and Dutch Technology Foundation (STW) issued positive feedback on the nomination, the State Secretary for Education, Culture and Science appointed Professor Gielen as the President of the Executive Board.

The Domain Boards are appointed by the Executive Board. The Executive Board may take advice from the scientific community on the appointments. Currently, domain board members include a mix of individuals from academia, industry and government.⁷⁸

⁷⁶ <https://www.nwo.nl/en/funding/funding+process+explained>

⁷⁷ <https://www.nwo.nl/en/news-and-events/news/2016/stan-gielen-new-chair-nwo-with-effect-from-january-2017.html>

⁷⁸ <https://www.nwo.nl/en/about-nwo/organisation/nwo-domains>

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

According to the current strategy document,⁷⁹ there is a plan to have an independent supervisory board that has oversight over the Executive Board. The composition and remit of this board are as yet unclear.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

Impartial operation is ensured through avoidance of conflicts of interest and transparency. To avoid conflicts of interest, NWO asks referees and members of the selection committee to sign and adhere to the NWO Code of Conduct on Conflicts of Interest.⁸⁰ The code of conduct also applies to board members and NWO staff involved in the funding process. Any conflict of interest is addressed in line with the Code of Conduct. External referees are usually recruited from outside the Netherlands as a way to reduce bias and conflict of interest.

NWO embeds transparency in its funding processes. Assessment panels (selection committees) are used to assess the quality of the proposals. The call text and criteria as well as the names of the panellists are published in advance of the assessments. Applicants are not allowed to talk to the panellists. Questions have to go through NWO. Panellists have to report if applicants approach them. Anyone who does this is ejected from the Call. Applicants get feedback on their proposals as well as rankings and send in a rebuttal. The decision-making board (usually the domain board) will look at panel reports as well as applicants' rebuttals before making their funding decisions.

Applicants have the opportunity to appeal funding decisions on the grounds of flaws in either the administrative process or scientific judgement. Appeals go to an independent review panel. Only about 5% (4-5) of the 100 or so complaints received per annum are upheld. NWO gets about 6,000 grant proposals every year of which about 1,000 are funded.

How are panels drawn together? How is suitability decided and ensured?

The selection committee/jury is appointed by the relevant decision-making board or body, usually the Executive Board or a domain board.⁸¹ The programme officer draws together a list of potential members and the decision-making board ratifies it after discussion. Committee/jury members are usually senior researchers and experts from the Netherlands and abroad with experience of assessing research, and can come from academia, other knowledge institutions, industry or civil society organisations. The number of committee/jury members depends on the size and nature of the funding instrument. Efforts are made to ensure breadth of representation across disciplines, universities/institutes, gender (depending on research field can range from roughly 20-40%) as well as length of career i.e. ratio of younger versus more established researchers. The Chair however is usually a senior researcher and committees for larger programmes (with more funds) usually have a greater proportion of senior members.

Committee members and referees are chosen by programme officers using international databases such as Web of Science, MEDLINE, ReviewerFinder and Scopus, as well as NWO data.⁸² The list of chosen referees may be submitted for advice to a subject specialist who is not involved in the proposals or the assessment process. Most referees are researchers who work outside the Netherlands and assess only one proposal. Recruiting referees from outside the Netherlands is a way to compare Dutch research proposals against international standards as well as a way to reduce bias and conflict of interest. A

⁷⁹ Connecting Science and Society. NWO strategy 2019-2022. Available at: <https://www.nwo.nl/en/documents/nwo/strategy/nwo-strategy-2019-2022>

⁸⁰ <https://www.nwo.nl/en/funding/funding+process+explained>

⁸¹ <https://www.nwo.nl/en/funding/funding+process+explained/assessment>

⁸² <https://www.nwo.nl/en/funding/funding+process+explained/peer+review+by+referees>

referee is approached only if an NWO policy officer finds that they have no known conflict of interest in relation to the proposal.

Selection committee or jury members are usually generalists who can assess a wide range of proposals while referees are usually experts in the subject area of the proposal to be assessed.

How is oversight of the panels' activities and conclusions ensured?

The decision-making board assesses whether the selection committee worked according to the procedure and selection criteria described in the call for proposals.⁸³ Board members have access to all relevant information such as research proposals, referees' reports, applicants' rebuttals, the description of the assessment procedure, the composition of the committee, and the assessment of the conflict of interest code. The board then takes a funding decision if it deems all procedures and conclusions to be sound. If not, it may deviate from the selection committee's advice, in which case it will state its reasons for doing so. The quality of external referees' assessments for each individual proposal are checked by the selection committees.

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

External reviewers assess scientific quality of individual proposals. The selection committee scores proposals weighing evidence from referees and rebuttals against other criteria for selection. The domain board makes funding decision on their recommendation.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

- Use of Experts in making decisions – There are scientists on decision-making boards and review panels, thus there are close links with the scientific community. The scientific legitimacy of decisions is hence assured
- Transparency
- Robust procedures
- Opportunity to appeal the decision – In practice, there are very few appeals and where there are appeals, they are usually rejected because the appeals committee agrees with the decision taken

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

The selection committee ranks proposals according to the criteria described in the call for proposals. The programme manager guides the committee to ensure the criteria are being applied appropriately in the assessments and that the correct procedures are being followed.

Usually impact and scientific quality are assessed by the same committee, for some programmes, especially with a societal or applied focus, multiple steps are used. Here, potential impact is as important as the scientific quality. Proposals are assessed by two different panels, first one that assesses scientific quality and then one that will assess potential impact and applications. Only proposals of high scientific quality will go through to the second panel, which consists of people who are not based at universities or institutes, though many have a history in academia.

⁸³ <https://www.nwo.nl/en/funding/funding+process+explained>

For interdisciplinary proposals, NWO tries to select referees from different disciplines, preferably with knowledge of interdisciplinary research in a similar area.⁸⁴ This approach is believed to do justice to the broader scope of the proposal and ensure coherence between the different disciplines involved.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence?

All materials on the basis of which decisions are made i.e. proposals, referees' reports and applicants' rebuttals are made available to the boards in addition to selection committees' funding recommendations. In addition, boards also have access to information on how the assessment procedures and conflict of interest code have been followed as well as the composition of the committee.

The domain boards trust the selection committee and usually accept their decision. The secretary of the committee (programme manager) will summarise the procedure followed by the selection committee for the domain board. If all seems alright, the selection committee's decisions are accepted.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Most do.

Programming: decision-making and balancing between scientific and extra-scientific considerations

NWO has a €1 billion budget of which about one third is for bottom-up research, which includes a talent programme for young scientists. Another third is for thematic programmes on topics such as cybersecurity and climate change. The topics for the thematic programmes are discussed with scientists (e.g. through mechanisms such as advisory committees) and the ministries before NWO makes a decision. The topics and budgets also depend on what external partners are prepared to contribute – for example, the government-designated top sectors, e.g. agri-food, water, high tech, energy and ministries, e.g. defence, justice, infrastructure.

NWO recently contributed to the National Research Agenda,⁸⁵ which is focused on societal challenges, societal impact and getting citizens more connected to science. Despite scientific scepticism, the initial response to the Agenda is encouraging. NWO got 12,000 responses from the public to a request for research questions on prime-time TV. The indications are that there will be lots of applications for this programme.

The actual design of the programmes and framing of the calls for proposals is done by programme managers. They talk to scientists about what kind of topics and fields the call should be open to.

Thematic programmes can be cross-domain. These are set up by cooperation between the relevant domains and sometimes also external parties. For each call for proposals under such a programme, it is first decided if one or more domains will be sharing the grant funding and management responsibilities i.e. who will do what administratively.

No formal oversight mechanism exists. Where problems do occur, they are usually exposed in NWO evaluations, which are conducted every 5 years or so. Moreover, the NWO administrators and members of the different boards have close relationships with the research community, so flaws in the programming are also communicated to NWO through these links.

⁸⁴ <https://www.nwo.nl/en/funding/funding+process+explained/peer+review+by+referees>

⁸⁵ <https://www.nwo.nl/en/research-and-results/programmes/dutch-national-research+agenda>

B.10 Swiss National Science Foundation (SNSF)

Swiss National Science Foundation (SNSF)	
Country	Switzerland
Budget	£796m spent on research in 2017
Thematic/disc. focus	All academic disciplines
Snapshot description	<p>SNSF was established in 1952, and is a private foundation. The SNSF is mandated by the government to support research across academic disciplines in Switzerland. It is the largest such organisation in the country. The SNSF funds</p> <ul style="list-style-type: none"> • Basic and use-inspired research projects • Career oriented research • Scientific exchange • Science communication • Fellowships abroad • National Centres of Competence in Research <p>SNSF funds the National Research Programmes and the National Centres of Competence in Research based on a mandate from the Swiss Confederation. SNSF also funds interdisciplinary breakthrough research through the “Sinergia” instrument.</p>

Structure of the funder

The organisation of the SNSF has four major components.

- The governing body is the **Foundation Council**, which has a President and Vice-President elected from within its ranks and an **Executive Committee** comprising 15 of its members (of which the President and Vice President are *ex officio* members)
- The **National Research Council**, has overall responsibility for assessing and approving grant applications. It is split into four divisions and three specialised committees. The **Presiding Board** comprises the President of the National Research Council, the Presidents of the Divisions and Presidents of the specialised committees.
- The **Administrative Office**, is led by a board of Directors. Its research funding divisions support the National Research Council.
- The **Board of SNSF** comprises the President of the Foundation Council, the President of the National Research Council and the Director of the Administration this is not an official structure of the SNSF.

In addition, the SNSF has **Research Commissions at Swiss Higher Education Institutions**, which are responsible for awarding mobility fellowships to postdoctoral students, selecting candidates for social sciences and humanities doctoral programmes, and giving general advice to their university on SNSF funding programmes.

The members of the **Foundation Council** represent Swiss higher education institutions (HEIs), Swiss Universities, the academies, and include representatives from politics and industry nominated by the Federal Council (Bundesrat) as well as co-opted members of NGOs, organisations of Nachwuchsförderung (organisations who promote young academics) and other foundations. Its composition and mandate is set out in the law. Its **Executive Committee** sets overall policy, negotiates SNSF’s performance contract with the Swiss Confederation, approves the budget, elects all NRC members and the Presiding Board of the NRC, appoints key managers in the SNSF administration, supervises SNSF’s activities and sets relevant rules under which it operates.

The Foundation Council also appoints a Compliance Committee (CC), which was established in 2014. The CC’s role is to support the SNSF in implementing reliable, fair, impartial and transparent

assessment procedures for its funding schemes. The CC systematically assesses the legitimacy and adequacy of funding decisions in terms of risk as well as the way compliance is organised and proposes improvements. It is elected by, and reports to the Executive Committee of the Foundation Council. It has five members. The person responsible for compliance within the Executive Committee of the Foundation Council assumes the presidency. Neither members of the National Research Council and of other evaluation bodies of the SNSF nor employees of the Administrative Offices may be elected as members of the CC.

The National Research Council (NRC) is the academic group that assesses proposals and allocates funding. It has about 100 members, who are nominated and proposed by the NRC itself (but elected by the Executive Committee of the Foundation council). The NRC reports to the Foundation Council. The NRC occasionally meets *in plenum*, chaired by the President of the NRC. This is a discussion and information forum. However, most of its business is conducted in the divisions.

The President of the NRC and the Presidents of the divisions and specialised committees together make up the **NRC Presiding Board**, which approves the funding decisions of the divisions, sections, specialised commissions and specialised committees.

The NRC comprises four divisions and three specialised committees. Three of these are disciplinary, funding response-mode proposals. The fourth handles national research programmes and the national centres of competence in research. The specialised committees...

The divisions and specialised committees all have a President and a Vice President. NRC members who evaluate proposals work at universities and spend around one day per week on SNSF business, for which they are remunerated. The NRC is supported by 90 external ‘evaluation bodies’ (peer review colleges) with over 700 reviewers. Divisions and bodies of the NRC are made up mostly of researchers working at Universities. Around a third are women and a third work at institutions abroad.

Figure SNSF Organigram



Source: <http://www.snf.ch/en/theSNSF/organisation/Pages/default.aspx>

The funding process

The four divisions (Humanities and Social Sciences; Mathematics, Natural and Engineering Sciences; Biology and Medicine; Programmes) and three specialised committees (names) are responsible for carrying out the assessment of proposals. Divisions and specialised committees can be sub-divided into sections, to which authority to assess proposals and make funding decisions is delegated, subject to the approval of the NRC Presiding Board. The divisions base their evaluation on peer reviews. They can also appoint Review Panels for scientific assessments, composed of external experts from outside Switzerland as well as members of the division. Decisions of review panels are subject to approval by the division.

Proposals are submitted electronically through the mySNF gateway. The assessment process generally has three stages: office eligibility check, external and internal review, and proposal ranking and funding decision.

- In the first stage the administrative office checks for eligibility.
- In the second stage, the proposal is assigned to an internal referee and co-referee, who are members of the NRC, and identified by the administration using a system of keywords selected by the applicant. Conflict of interest rules are applied at this stage. The proposal is then sent to external peer reviewers, who may be chosen using a tool based on Scopus or by other means, and who provide a scientific assessment of the proposal. The referee and co-referee read the proposals and external reviews and make their own assessment (using a six-point scale).
- In the third stage, the proposal is presented in a division, specialised committee or panel meeting where proposals are ranked and funding decisions are made. These decisions – after their approval by the NRC - are communicated to the applicants approximately six months after submission

Neither the names of the external reviewers nor those of the internal referees are made public, but the anonymised texts of external reviews are shared with the applicants.

For careers funding, there are interviews and external review. If proposals are to be assessed by a Review Panel, as is the case for the careers grants, SNSF makes use of standing panels which are appointed by the specialised committee for careers. National Research Programme proposals are assessed using a two-step process, to reduce the peer review burden. In the first step, short proposals are read by an expert panel. Those accepted then go on to produce a full application, which is assessed in the normal way.

In most cases, the Presiding Board of the NRC needs to approve the individual funding decisions made by the divisions or specialised committees, though some smaller funding decisions can be made locally without the need for approval. The point of the approval is to check that the assessment process has been correctly done in a robust way. Decisions not endorsed by the Presiding Board are sent back for reassessment. In parallel, the compliance committee can conduct spot checks on the processes and ensures they are in line with the mandate from the government but does not test the actual decisions made.

Detailed points

Who is represented at the high-level decision-making body, how are they recruited?

Members of the NRC are elected to their positions through a nomination process.

The presidents and members of the divisions are nominated for election by the divisions themselves. Their nomination is approved by the NRC Presiding Board, which passes it on to the Executive Committee of the Foundation Council. Nomination process: A committee composed of the division presidents, a second division member and the head of office conduct interviews with candidates in the presence of a representative of the Executive Committee of the Foundation Council. The candidates are

discussed by the divisions who then forward their nomination to the Presiding Board along with a full list of all applications received. The presiding board discusses the nomination, may make changes and then sends it to the Executive Committee of the Foundation Council. The Foundation Council Executive Committee conducts elections in a secret ballot and the candidate receiving the majority vote from Foundation Council Executive Committee members is elected.

Throughout all of its recruitment processes, the SNSF strives to achieve an equal representation of men and women in the Research Council. For example, until equal representation is achieved, women will be given preference in the event of applications of equal quality being received in elections.

Is there a person or group that has oversight and intervention power at the high-level decision-making body?

The NRC presiding board has oversight of funding decisions. The NRC organisation regulations stipulate that decisions of NRC bodies “*are made by a simple majority vote of those present. The President also votes and in the event of a stalemate he/she has a casting vote. In matters of urgency, decisions can be made in written form. They require the approval of a majority of members.*” The NRC organisation regulations also stipulate that “*the president may at his or her own discretion support measures that are in line with the objectives embodied in the Statutes of the SNSF.*” Limited funds are reserved for this purpose in the annual budget.

More generally, how is impartial operation of the high-level decision-making body ensured? How are conflicts of interest avoided?

Members of the Presiding Board of the NRC are subject to Conflict of Interest regulations as any other member of the NRC and of anybody involved in the evaluation process. If a member of the Presiding Board has a conflict of interest with a research proposal to be approved in the Presiding Board meeting, that particular member will leave the room before the decision is taken.

How are panels drawn together? How is suitability decided and ensured?

Panels (when used) are drawn together by the specific Division or specialised Committee based on a recommendation from the members. Depending on the type of panel, they are appointed by the Division, Specialised Committee or the Presiding Board of the Research Council. When selecting experts, the SNSF checks whether the reviewers have any potential conflicts of interests.

How is oversight of the panels’ activities and conclusions ensured?

The endorsement of decisions first by the divisions or specialised committees and then by the Presiding Board is a means of verifying that the evaluation procedure has been implemented correctly. Accordingly, the Presiding Board only discusses applications where procedural errors are suspected, or which constitute a precedent. All assessment information is made available to the committees, NRC and presiding board by default. The compliance committee can review the decision making process (see below).

What is the division of labour in terms of judging scientific quality between the high-level decision-making body, the panel(s) and, potentially, external reviewers?

External reviewers assess scientific quality in the first instance, normally for only one proposal. The internal referees then also assess the proposal scientifically, assess the reviewer comments and decide which grade to give, in comparison with about 10-20 proposals in his or her field. Each proposal and the recommendation of the referees are then discussed in the division, specialised committee or other evaluation body, which votes on a final grade, ranks proposals and decides on funding, based on the budget available.

Which parts of the process are most important in terms of ensuring not only that the best science gets funded, but that the funding decisions are perceived to have legitimacy?

The external expert (peer) reviewers are a key test of scientific quality because they tend to have more specialised knowledge than the internal referees. The NRC referees necessarily have to be more generalist in character.

Smaller countries like Switzerland need to make use of international expertise in proposal assessment, in order to avoid conflicts of interest and social obligations that appear in small communities. SNSF is addressing this challenge by creating panels and committees where the NRC members participate together with international reviewers.

If Research council members submit a proposal they have to step down from all evaluation-related discussions (but not strategic discussions) up until the final decision to avoid being involved while their proposal or its competitors is discussed.

The Compliance Committee systematically assesses the legitimacy and adequacy of decision-making processes in terms of risk as well as the compliance organisation and proposes improvements:

- It examines and assesses compliance with the rules set out in the law, the Statutes, the regulations and internal guidelines.
- It examines whether the scope for decision-making or ‘margin of appreciation’ is used equitably and in accordance with the principles of the evaluation procedure as defined in the Statutes, the regulations and the guidelines.
- It examines and assesses measures for guaranteeing the legitimacy and adequacy of funding decisions (compliance organisation) and proposes improvements.
- It offers advice on the risk assessment of the SNSF and points out gaps in risk management with regard to the scientific activities of the SNSF.

How is scientific quality ensured when other criteria (e.g. relevance to a challenge, use to industry, inclusion of non-academic partners) are also present?

Scientific quality is the key criterion for funding, with originality and ‘topicality’ supporting this assessment. Suitability of methods and feasibility are the second set of general criteria. Applicants may indicate that their application is ‘use inspired’ meaning that the research results could be readily transferred to practice and bring about broader impact. If this is the case, the potential for broader impact is used as a criterion along with scientific quality and applicant criteria. This aims to ensure that use-inspired applications are not at a disadvantage due to having to fulfil an additional criterion.⁸⁶ In addition, the SNSF may engage non-academic reviewers with expertise in applied research to further ensure those use-inspired proposals are robustly assessed.

How is the reliability and legitimacy of the funding decisions (or proposals for funding decisions) made at lower levels communicated to the highest-level decision-making body (academic/research council, board, etc) so that they can approve these decisions in confidence?

All members of the NRC Presiding Board receive a list of provisional decisions taken by the evaluation bodies before the relevant Presiding Board meeting. The endorsement of decisions by the Presiding Board is a means of verifying that the evaluation procedure has been implemented correctly. Accordingly, the Presiding Board only discusses individual applications where procedural errors are suspected, or which could create a precedent. It is rare for decisions coming up to the presiding board

⁸⁶ See Kolarz P, Arnold E & Farla K (2017) Use-inspired basic research at SNSF. Technopolis: http://www.snf.ch/SiteCollectionDocuments/SNSF_UIBR_Final_Report_by_Technopolis_May2017.pdf

to be rejected. The Presiding Board can instruct the administration to organise a new assessment, if necessary.

The administration monitors how many reviews proposals receive, the gender balance of recipients and the way the decisions were made in committees (amongst other factors that are monitored). This helps the Presiding Board consider whether rule changes are needed. The Compliance Committee looks at the way the Presiding Board applies its own rules. It reports to the Executive Committee of the Foundation Council, to which it proposes a yearly plan of activities . It has access to any information it requires for its work.

What can you determine about the educational qualifications of key staff members such as department heads and those responsible for identifying peer reviewers. Do they have PhDs?

Most members of the administration involved with funding decisions have PhDs. Some of them have some post-doc experience; others come directly from PhD studies. Other admin staff tend not to have PhDs.

Programming: decision-making and balancing between scientific and extra-scientific considerations

National research programmes, which include structural objectives, and the National Centres of Competence in Research (NCCR) are the main type of regular programmes funded by the SNSF. These are ultimately decided by the Federal Council, preceded by a lengthy consultation process in which the SNSF plays an important role, notably by conducting a feasibility study, which focuses largely on scientific feasibility (i.e. does Switzerland have a suitable researcher base and is the scope of the proposed programme such that it lends itself to research?). Once a National research programme is set up, a steering group is convened, consisting of various researchers, practitioners, an administrator and one NRC member. The feasibility study in the programme creation is therefore an important aspect of scientific quality assurance. The steering group, NRC representative and administrator then run the programme and ensure scientific quality from there onwards.

The SNSF also has one-off calls on certain topics that need research. For example they have launched a programme called “digital lives” because of a research need in Switzerland. The responsible division led the development of this call using stakeholder workshops with researchers. This was a one-off call. Longer-term initiatives are integrated in four-year planning documents proposed by the Research Council, approved by the Foundation Council, submitted to the Government and decided on by Parliament. Examples are the Programme for Investigator Initiated Clinical Trials or the Programme Bridge which funds projects at the interface between research and innovation.

New funding instruments are discussed and approved by the NRC Presiding Board. In very important cases, they also go to the Foundation Council Executive Committee.

The planning process for national programmes is seen as guaranteeing scientific as well as societal legitimacy. There does not appear to be any further mechanism to ensure the scientific legitimacy of programming decisions at the SNSF.

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