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Evaluation of the Research Council of Norway

Background Report No 2 - RCN Organisation and Governance

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Summary

RCN's character as a multi-principal agency with a broad set of system-wide responsibilities imposes a heavy organisational and administrative load. This is exacerbated by the growing complexity of science and technology, the increasing importance of interdisciplinarity and cross-sectoral problems and the large number of stakeholder groups to which it must relate.

Multi-principal agencies are particularly susceptible to governance lock-ins. The need to provide RCN with a degree of strategic freedom beyond that provided by its principals was recognised already in 1999 and led to the creation of the Fund for Research and Innovation. Amongst other things, this allowed RCN to implement significant programmes to strengthen research capacity and pursue national thematic research and innovation priorities. However, the Fund has successively been earmarked and has now finally been abolished, owing to the low returns it has been generating since the start of the financial crisis. It has been replaced by budget-line funding from KD. While the intention appears to be to continue to provide this money as a strategic resource, bringing it into the annual budget process makes it more exposed than before to the normal political risks, constraints and potential lock-ins associated with budgets.

In our view, the reorganisation of RCN in 2010 was useful. It addressed the need for thematic and disciplinary expertise at the Division Board level and allowed RCN the possibility to strengthen its position in relation to the process of formulating national research and innovation strategies that is increasingly taking place at the level of the Ministries. It strengthened line management by reducing functional overlaps among divisions and made the structure of RCN more transparent. Weaknesses of the new organisation structure are complexity (which to a small degree explains an increase in the number of staff employed) and the disappearance of an 'arena' specifically for new and strategic initiatives by locking the successors of the Strategic Priorities Division into specific themes.

The reorganisation was well conducted. While the impulse came from the Director General, staff and key external stakeholders were individually and collectively consulted and a broad consensus was reached that the reorganisation was desirable. Key individuals were redeployed in a manner that appears to have caused little or no friction. Internal and external stakeholders are happy with the result.

While the new structure represents an improvement on the previous one, it remains complex – and a deal of that complexity is externally imposed through weak coordination of research policy at the level of the 16 ministries. In its broad lines, it is difficult to find principles of organisation likely to reduce the level of complexity. In the detail, some tasks appear overly decentralised. In particular, evaluation, analysis, statistics and the parts of IT associated with maintaining databases of projects and experts need to have strong and responsible leaders, in addition to the networks currently working across RCN. The lack of a strong, central strategic analysis group means that the centrifugal forces caused by RCN's multi-principal governance have not been strongly opposed by a powerful, internal centripetal force. An analysis group recently set up in the Director's staff is intended to take on this role. International practice would argue for placing at least part of the analysis function at the centre and for caution in designing over-complex organisational matrices.

RCN's administrative costs are paid partly by KD via a dedicated administration budget and partly by the other ministries, which earmark a small percentage of the money they spend through RCN to cover 'management' costs. Overall, the proportion of the budget spent on administration and management has declined from 8% in 2003 to 7% in 2010. Accompanying this increased efficiency has been a reduction in the use of external contractors, who previously played a more significant role in programme

management. This increasing efficiency has been accompanied by a rationalisation in the number of programmes or schemes offered (from 229 to 178) and an increase of about 10% in average project size. There has been substantial investment in IT systems and standardisation of proposal and assessment procedures (admittedly across a large number – 22) of funding instruments.

The RCN staff is highly qualified (15% have a PhD), ageing (half are over 50) and disinclined to leave (staff turnover was only 4% in 2010). Overall numbers have risen from 330 in 2004 to 411 in 2010 and 455 today. The proportion of people at Special Advisor or Director level rose from 27% in 2004 to 37% in 2010. The proportion of women rose gently from 60.5% to 62.9% in the same period.

Timesheets have only recently been introduced and the reliability of the data collected so far is uncertain. In the aggregate, however, these data suggest that RCN personnel spend 25% of their time on programme management, the same on creating and sharing strategic intelligence, 15% on national 'meeting places' and 10% on internationalisation. This tends to confirm our view that transaction costs in RCN are high.

The reduction in the number of programmes has been accompanied by a fall in the number of Programme Boards and scientific committees from 80 in 2004 to 45 in 2010 – and a faster decline in the number of members from about 700 to some 300 – half of them from the Norwegian research sector, 16% from abroad (mostly researchers), 16% from industry and the rest largely from the public service. The research community therefore has about two thirds of the places in RCN's committees. Industry is little represented outside the Innovation Division. The proportion of foreign experts has doubled since 2006.

At Division (DS) and Executive Board (HS) level, relevant stakeholder groups appear well represented. Many of the DS and HS Board members interviewed were frustrated that the three-level steering hierarchy and the limits to their authority posed by the requirements of the funding ministries led to a lot of 'rubber stamping' of decisions. It was inconceivable to operate RCN without the HS and Programme Board (PS) levels; the DS were needed partly for span-of-control reasons and partly to give legitimacy to division operations. There seems to be universal admiration in the Boards for the quality and effectiveness of RCN administration, which was often amenable to advice on implementation from the Boards. While the PS have real influence over programme design and composition, the higher levels were largely not empowered to take strategic decisions; it appeared impossible to trigger significant changes in direction from within the Boards. Some Board members argued that greater influence than this would be unreasonable, in the context of public service and an organisation whose main remit is to implement policy. The DS and HS Boards play a large role in the development of RCN strategy. However, this primarily involves overseeing the aggregation of the results of detailed initiatives taken at the level of the people in RCN who handle relations with the funding ministries. The Boards do not have a separate or independent source of analysis that would form the basis for proposing alternative strategies. In effect, their ability to set strategy is limited not only by the complex principal-agent governance system within which RCN lives but also by information asymmetry.

RCN has significantly improved the way it processes applications in recent years – a fact reflected both in the researcher survey and in interviews with stakeholders. Procedures are documented and for the most part transparent. Each funding instrument has a defined process. The ERC process heavily influences the process for 'bottom-up' and thematically specified scientific proposals. Proposals to programmes are assessed via international scientific peer review as well as by the relevant Programme Board, which makes final decisions. Innovation projects are additionally assessed by the administration for likely socio-economic impacts before the Programme Board takes a final decision. 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 Main Board of RCN. Applicants get feedback, comprising referees' comments and the scores allocated in the course of appraisal and have the opportunity to appeal decisions. Processing times are rapid. RCN has some difficulty in handling interdisciplinary proposals – a feature common to all research funders. Current practice may obscure the extent to of interdisciplinarity in proposals, making it hard to see whether these are assessed adequately. But more broadly, RCN assessment procedures are consistent with good international practice among research councils and innovation agencies such as those in the other Nordic countries and Austria.

Success rates vary widely across RCN's different instrument and programmes. Unsurprisingly, some specialised areas such as space research have high success rates. User-driven R&D projects also enjoy a high success rate. However, FRIPRO has a very low overall success rate and this is a matter of great concern to the research community since it is the national programme for competitive researcher-initiated project funding. Analysis of the overall scores allocated to FRIPRO proposals in 2011 shows that 30% were fundable (in the sense of having an overall score of 6 or 7 on the 7-point scale used), and that half of these proposals were actually funded. Overall success rates were lowest in the social sciences (12%) and highest in humanities (20%). However, the proportion of fundable proposals actually receiving funding was lowest in mathematics, natural science and technology (40%). RCN's policy of allocating money to broad discipline groupings in proportion to the amount of university research effort done in each supports existing capacity but can drive differences in the proportion of excellent proposals funded.

The universities and research institutes are the organisations that submit the highest proportions of fundable proposals. There is quite a long 'tail' of medium- and low-quality proposals. The proportion of low quality proposals is greatest among the universities and university hospitals, suggesting that these organisations do less quality control of outgoing proposals than the institutes.

Our assessment of RCN's institutional boundaries with SIVA and Innovation Norway (IN) suggests that RCN boundaries with SIVA are overall clear and well understood. Areas of overlap exist with IN, where the two organisations cooperate. This does not seem to cause problems for beneficiaries. Collaboration between the two agencies is long established and is increasing. It could be improved in relation to information sharing and there may be potential to make better common use of the organisations' international networks.

There seems to be a "valley of death" problem that is not addressed by any of the agencies. Interviewees and other Norwegian actors (notably FIN, the Association of Technology Transfer Companies in Norway) mentioned gaps in the seed-corn funding aimed at supporting commercialisation of research or innovations, which hinder the expansion of Norwegian growth companies. Testing this perception would require wider study than is possible within this evaluation.

1. Introduction

This background report for the evaluation of the Research Council of Norway focuses on the way RCN is governed internally and externally, how it is organised (and reorganised), and how it implements its main management processes. It also covers the topic of institutional boundaries with RCN's sister agencies in the RD&I system, SIVA and Innovation Norway.

The report is structured as follows:

- In Section 2 we discuss the background and briefly describe the Research Council's position in the RD&I system, its sources of income and its funding instrument portfolio
- In Section 3 we look into RCN's organisational structure and resources, performing also a process evaluation of the 2010 divisional reorganisation of RCN and an analysis of the structure adopted in RCN for its internal coordination
- Section 4 assesses the governance structure, based on the three-level hierarchy and illustrates the division of labour between the various components of RCN's organisational structure in some key management processes
- The quality and integrity of the funding processes are among the most central concerns of many of RCN's stakeholders and we cover these topics in Section 5, placing special emphasis on the range of practice and connecting the processes used to the particular needs and purposes of different instruments
- Section 6 discusses RCN's institutional boundaries with Innovation Norway and SIVA

At the end of each of these sections, a summary of the main findings is provided, including wherever appropriate comparison with international practice.

2. Background

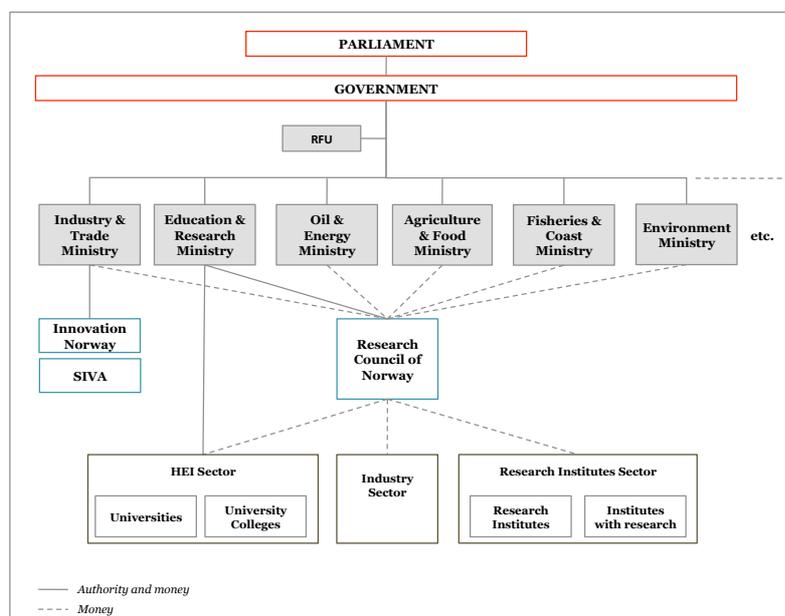
In this Section we briefly describe RCN's positioning in the RD&I system and its sources of income. We also provide an overview of RCN's instrument portfolio.

2.1 The Research Council in the Research and Innovation System

The Research Council of Norway (RCN) is an agency of the Ministry of Education and Research (KD). It is the national strategic and *executive* body for research; it also acts as an *advisory* body to the Government in relation to research policy.

In the Norwegian Research and Innovation governance system (Figure 1), all Ministries have responsibility for research in their sectoral fields and all of them, except Defence, allocate part of their research budget through RCN. The Council's share of the overall Government expenditure for R&D was fluctuated slightly in the last decade around a value of some 27%. Its budget is defined by the ministries on an annual basis.

Figure 1 The Research and Innovation Governance system in Norway



RCN plays the role of both a funder of basic and applied research in the higher educational institute sector ('research council' and an innovation agency. Its responsibilities cover the development of research as well as the overall functioning of the research and innovation system. The 2011 statutes¹ state:

"The Research Council of Norway shall

- Support basic research and seek to encourage development within the various research fields and disciplines as well as to ensure inter- and multi-disciplinarity in research
- Support research that encourages public debate and contributes to the development of democracy and the formulation of policy
- Promote innovation in public and private sectors in all parts of the country

¹ Statutes of the Research Council of Norway – new version – 1 January 2011

- Promote coherence and interaction between basic research, applied research and innovation
- Fulfill national responsibilities with regard to dissemination of research and work to promote the uptake of research results
- Promote international research cooperation
- Work to ensure the highest possible quality in Norwegian research activities;
- Work to achieve cooperation and cohesiveness between public agencies within the research and innovation system
- Work to achieve constructive distribution of tasks and cooperation between research institutions, and take strategic responsibility for the research institute sector
- Ensure the evaluation of Norwegian research activities
- Provide input to government authorities as a basis for the formulation of research policy”

As an advisory body, it is supposed to provide ‘input’ to the Government and Ministries for the formulation of research policies, and act as an arena for public debate and the consultation of research communities.

RCN’s role as a multi-principal agency combined with its broad responsibilities for the research and innovation system imply that the Council relates to a vast range of stakeholder communities. All of these actors in the RD&I system have influence on RCN’s activities and are direct or indirect beneficiaries of its activities.

All funding Ministries have an interest in and - to a greater or lesser extent - steer RCN’s strategies, programmes, and instruments within their field of competence. There is a constant flow of information to and from the Ministries, in particular related to the focus of the funding by the specific Ministries. The sheer number of Ministries and their different needs and requests, combined with the increasingly complex and cross-sectoral nature of the research activities funded, implies that this constitutes a huge workload for RCN.

In line with Norway’s strong culture of stakeholder participation and consultation, RCN also communicates with and consults the research performing sectors, ie Higher Education institutes, research institutes, and industry. Representatives of these stakeholder communities make up RCN’s governance boards (the Executive, Division and Programme Boards) and constitute the committees dealing with programme planning, scientific discipline evaluations, or strategic intelligence transfer on specific issues. They are also consulted on a broader scale for the development of sector-specific strategies or programmes and on a regular basis through formal or informal contacts with the RCN administration.

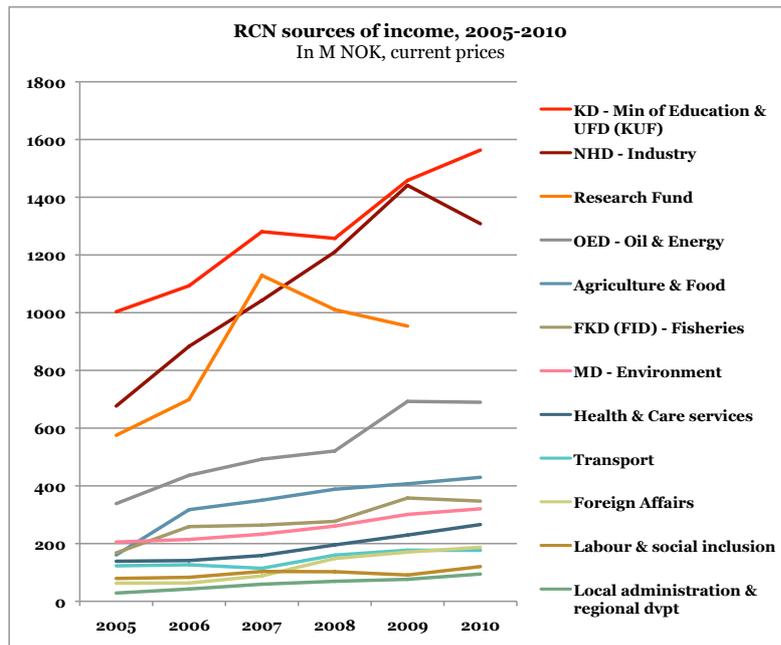
2.2 Sources of income

Close to half of RCN’s income is provided by two key ministries: the Ministry of Education and Research (28% of Ministry funding in 2010) and the Ministry of Industry and Trade (23% in 2010). Other ministries with a relatively important share in RCN’s funding are the Ministry of Oil and Energy (~10%) and the Ministries of Fisheries and Coast, Agriculture & Food, and Environment, each accounting ~5%.

Government spending on R&D has seen a large increase in the last decade, rising from 10,137 M NOK in 2000 to 15,749 in 2010 (real price, fixed 2000). This rise in spending was reflected also in the budget allocations to RCN by the various ministries – especially by the Ministry of Education and Research in 2004 and the Ministry of Industry and Trade from 2006 onwards – and especially in 2008 and 2009.

Figure 2 shows the trends in RCN’s sources of income, and in particular the ministries’ contributions to RCN’s budget from 2005 to 2010. The Ministry of Agriculture considerably increased its share as of 2006 (from 5% of Ministry funding in 2005 to 8% in 2010); also the share of the Ministries of Oil & Energy and of Fisheries had a positive trend in the most recent years (respectively 12% and 6% in 2010, compared to 11% and 5% in 2005).

Figure 2 Trend in RCN's sources of income



Source: RCN data, 2011 – Technopolis analysis

The Fund for Research and Innovation was a sector-independent source of income for research funding set up in 1999 and managed by the Ministry of Education and Research (KD). Since 2006, the Fund constituted the third largest source of revenues for RCN; it accounted for 15% of RCN's overall income in 2005 and 2006, rose to 20% in 2007 and then gradually dropped back to 15% in 2009.

In its annual reports, RCN repeatedly stressed the critical role the Fund has played to “ensure stable, long-term financing of research activities, safeguard basic research, and facilitate cross-sectoral initiatives among the ministries”, providing RCN strategic room for manoeuvre beyond the Ministry steering. RCN used this fund for the launch of new systemic interventions such as the Centres of Excellence (SFF) and Competence Centres (SFI and FME) as well as for launching the Large-scale programmes

The Government increasingly used parts of the Fund revenues for additional purposes such as participation in the EC Framework programmes. Due to the decline in interest rates, it was decided that as of 2013, the Fund would cease to exist and be replaced by budget-line funding from the Ministry of Education and Research.

2.3 The RCN Instrument Portfolio

2.3.1 RCN categorisation

RCN has a vast portfolio of schemes for competitive research funding, comprising programmes, response-mode funding schemes, Centre schemes, and other specific schemes focusing on capacity building - all of them covering the full range of basic, applied and ‘innovation-oriented’ research.

RCN also handles the core funding for research institutes and is occasionally charged with the management of appraisal processes for ministry research funding schemes outside its remit.

The Council categorises its research budget into budget lines for management costs and 4 groups of major funding schemes (*Virkemidler*):

- Research programmes, ie basic research programmes, user-led innovation programmes, policy-oriented programmes (also called ‘action-oriented’ programmes) and Large-scale programmes
- Infrastructural and institutional measures, comprising Core funding to research institutes and other R&D groups, funding to Centres of Excellence (SFF), Centres for Research-based Innovation (SFI) and Centres for Environment-friendly Energy Research (FME), and for scientific equipment, databases/collections
- Independent projects, i.e. bottom-up basic or innovation-oriented research (response-mode funding). This category includes also R&D projects aimed at fostering international cooperation
- Networking measures, including support for the development of strategic networks (national or international), graduate schools (*Forskerskoler*), and ‘systemic measures’, such as programmes fostering regional development (the VRI programme) or the uptake of research outputs

Policy-oriented and Large-scale programmes can encompass basic and applied research, as well as user-directed research for innovation. Large-scale programmes were launched with the explicit intention of coupling basic research, applied research and innovation through the strategic use of different funding instruments.

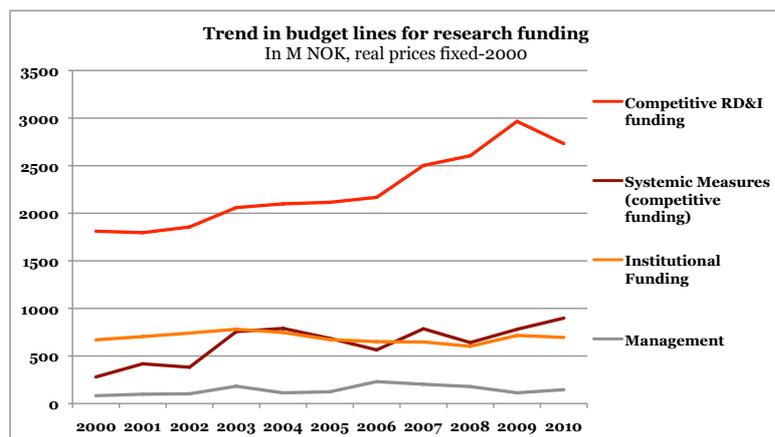
All programmes include different instruments in their project portfolio, ie individual grants, research projects, and other support instruments. This flexibility in the programmes’ project portfolio is based on the definition of a broad set of proposal/project types, making distinction between individual grants versus projects or other support instruments, scope of the support (preparation of projects, projects, mobility, events, etc), and main stakeholder targeted with the support (researcher, user, Post-docs or PhDs etc). Innovation-oriented instruments are specifically defined, while various ‘other’ categories group instruments developed in the context of a specific programme or scheme. The RCN database lists 20 proposal types or instruments (see also Section 5.1). The programmes’ calls for proposals specify which instruments are permitted in the specific call, based on their annual action plans that are in turn based on the programme plans.

2.3.2 *Categorisation based on the intervention logic*

In the context of the composition analysis conducted for this study (see background report –No 5), we classified RCN’s budget lines into three major funding categories: management costs, competitive research funding, and non-competitive research funding. The latter includes the core funding to the research institutes and the strategic institutional projects, which are only partly competitive. The ‘competitive research funding’ budget line contains two major categories: competitive funding for RD&I and a set of systemic measures including funding for research infrastructures, centres of excellence (SFF) and competence centres (SFI/FME).

There was a considerable rise in competitive research funding over the last decade, and in particular since 2006, accounting for most of the increase in RCN research funding (Figure 3). In 2010 competitive research funding accounted for 81% of the research budget, compared to 77% in 2004 and 71% in 2000. This is consistent with the government’s view over the past decade that research performing organisations should become more autonomous and that they should therefore increasingly be steered via incentives provided under competition. Funding for systemic measures also grew, predominantly thanks to the Centre programmes and the Research and Innovation Fund. The budgets for institutional funding and management costs remained fairly stable.

Figure 3 Breakdown of RCN’s research funding budget



Source: RCN data, 2012 – Technopolis analysis

We defined 7 categories in the policy mix, reflecting the focus of the competitive research funding. For this, we combined RCN’s proposal/project and scheme/programme categories – wherever possible.

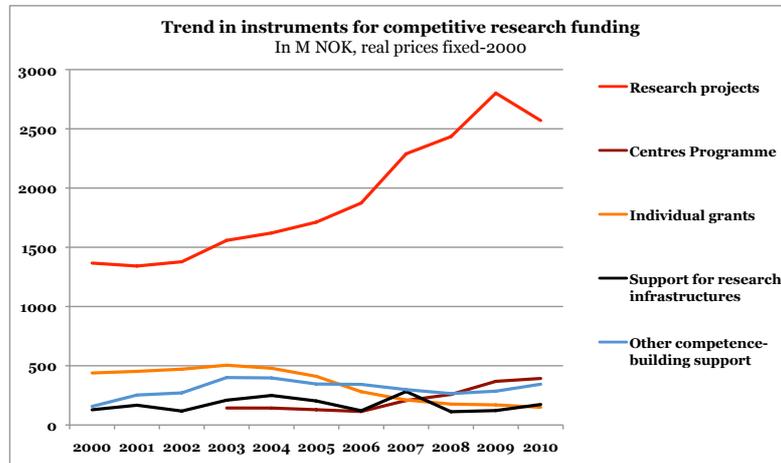
- Basic research, accounting for ~15% of RCN’s competitive research funding budget in 2010
- Mission-oriented research, i.e. all ‘non-innovation’ oriented research in the Large-scale programmes and policy-oriented programmes – 25% of the competitive funding
- Research for innovation, including both bottom-up and thematically steered innovation – an investment of 30% of the competitive research funding
- The Centres programme, including the Centres of Excellence and the Competence Centres – 11% of competitive funding in 2010
- Competence development for research, such as support for infrastructures, network development, (competitive) institutional funding, dissemination – 10% of the funding in 2010
- Innovation capacity building, such as the schemes fostering uptake of research results (FORNY) or regional innovation (VRI) – 3%
- Support for international cooperation – accounting for 5% of the competitive funding

The instruments adopted for the competitive funding of research can be classified into 5 major categories: research projects, the Centres, individual grants, support for research infrastructures, and other competence-building support measures such as the co-funding of international projects.

Figure 4 shows the increase in funding for the research projects and centres, while the other instrument categories have had a relatively stable level of funding. The only exception is the individual grants, whose funding has been declining since 2005. They

had a share of 4% in 2010, compared to 17% in 2004. Since 2008, RCN adopts this instrument increasingly to foster international mobility (12% of the funding for individual grants in 2010, compared to 2% in 2004).

Figure 4 Trend in instruments for competitive research funding



Source: RCN data, 2012 – Technopolis analysis

3. Organisational Structure and Resources

In this Section we describe and assess RCN's organisational structure and processes, including the 2003 and 2010 re-organisation, the procedures developed for coordination within RCN, its financial and human resources and the involvement of stakeholders in its activities by means of the various committees. We conclude this section with a summary of our most important findings, setting them against international practice.

3.1 The 2003 and 2010 re-organisations

3.1.1 Trends in RCN's organisational structure

Until 2003, RCN's organisational structure consisted of 6 'research' divisions, organised primarily according to disciplinary and sectoral boundaries (Figure 5) that reflected boundaries among the organisations merged to form RCN in 1993. All the divisions except Industry and Energy (IE), funded researcher-led basic and applied research, while the Science and Technology division (NT) funded basic research activities that underpinned the disciplines covered by all of the other divisions.

The Director General and his staff managed the day-to-day administration of the Council and functioned as the secretariat to the Executive Board, while the Strategic Planning Division assisted the Executive Board and the Director General with research policy, internal planning, budgeting and other aspects of RCN's information systems and functions. The Organisation & Finance Division performed a range of functions pertaining to the internal administration of the Council (HR management, IT, etc); the Public Relations & Information Division managed the production of documents, press and public information.

RCN was radically reorganised on 1 September 2003. Three overarching divisions were set up in place of the disciplinary and sector organisation previously used,.

- The *Division for Science*, focused on funding long-term and basic research
- The *Division for Innovation*, focusing on industry-oriented research and having a greater emphasis on user needs
- The *Division for Strategic Priorities*, which was to provide the opportunity better to exploit synergies between basic research and industrial research through crosscutting initiatives (the Large-scale programmes).

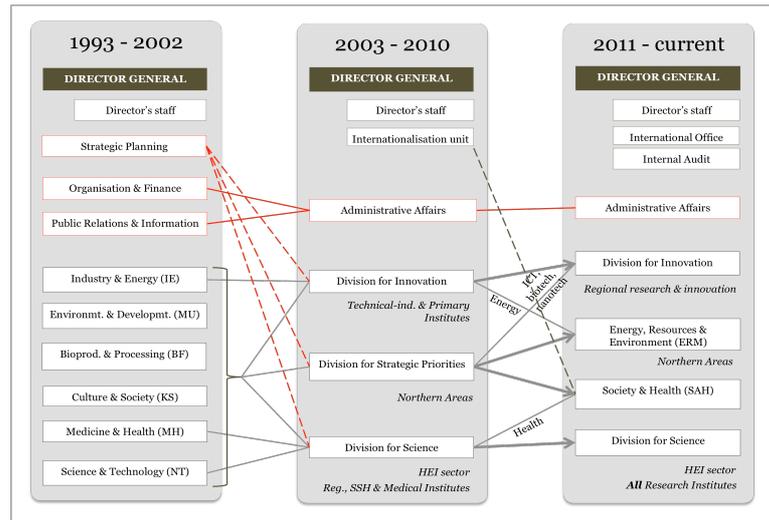
The reorganisation also resulted in a sharper focus on international cooperation and participation in EU research, and the Director's staff was made responsible for the coordination of international affairs.

The three 'research' divisions also took on other functions

- The *Division for Science* was given responsibility for research-related infrastructure and professional development, for the government-allocated core funding to regional institutes and institutes in medicine, health science and social science, and was charged with promoting applied research in medical and health science fields
- The *Division for Strategic Priorities* was given responsibility for the strategic analysis of societal challenges and was to set up programmes in specific policy spheres, focusing on areas of particular importance for Norwegian research. The Division also had primary responsibility to follow up RCN's initiative for the Northern Areas
- The *Division for Innovation* was responsible for the management of industry-oriented research as well as the support schemes for innovation, such as the tax incentive scheme Skattefunn. The Division was also responsible for the government-allocated basic funding to the technical-industrial and primary industry research institutes

The new *Administration Division* covered the functions of the previous Organisation & Finance and Public Relations & Information Divisions. It had major responsibilities in implementing a cohesive and efficient financial and administrative system, including a project for Internet-based research administration (the IFA project), the coordination of RCN's activities relating to impartiality and legitimacy, and a specific department was established for joint planning, budgeting and finance (Planning and Finance Department). The former Personnel Department became a Department for Human Resources, with responsibilities that included enhancing expertise and organisational development.

Figure 5 Development in the RCN organisational structure



Source: Technopolis, 2012

RCN undertook a significant restructuring in 2010, creating a mix of 2 priority-focused divisions and 2 divisions reflecting RCN's functions as a research council and an innovation agency.

The most pertinent change involved the split of the Division for Strategic Priorities (SATS) into two divisions centred on the two main dimensions of national and international research priorities in relation to Welfare: the Division for Energy, Resources and Environment (ERM) and the Division for Society and Health (SAH).

Both divisions were to cover the entire range of research in their specific fields (from basic research to innovation) and the Division for Society and Health was additionally assigned responsibility for the bi-lateral international cooperation agreements (previously under the Director's staff International Unit).

The Division for Innovation took on the responsibility for funding research tackling the national priorities in terms of Technologies, ie ICT, biotechnology and nanotechnology and the new materials. It was given more responsibility for strengthening the knowledge-based economy and research-based innovation and was also put in charge of RCN's contribution to regional research and innovation.

The Science division focuses on basic research (predominantly bottom-up) and was assigned overall responsibility for a well-functioning research system, with strategic responsibility for the universities, university colleges and all the independent research institutes.

We cover the tasks of the current divisions more in detail in Section 3.2.

3.1.2 The 2010 re-organisation: rationale, modalities and effects

RCN administration states that the purpose of the reorganisation was to align RCN's organisational structure better with developments in the research and innovation

context. In the paper acting as the basis for discussion in the Executive Board³, it pointed out that in the 7 years since the restructuring in 2003, socio-economic challenges had significantly gained importance and constituted a legitimate basis for research priorities. Innovation was more clearly seen as an expected result of research, with stronger expectations set for research in the relevant technologies. Other priorities were the efficiency and effectiveness of the research system and increasing the quality and internationalisation of research.

The RCN paper also hints at some internal drivers. It pointed to the need for RCN to strengthen its positioning as strategic advisor in the Norwegian RD&I system, stating that “key research strategy processes are to a greater extent being implemented outside the Council; RCN is therefore challenged in its strategic role”. The re-organisation was intended to provide RCN with “a clearer research policy and a clearer voice”, and allow it to play a stronger role in the national strategy processes. The sharper focus of the systemic responsibilities in the various Divisions was expected to be beneficial from this perspective. The split of the Strategic Priorities Division was also intended to enable the Division Board to improve its strategic advisory function through a clearer thematic definition of the new divisions. This was a need that had already been identified in RCN’s self-evaluation of 2006⁴.

The RCN paper – and RCN interviewees – also mentioned that tensions had arisen within RCN itself between the responsibilities of the Divisions for basic research and innovation on the one hand and the overarching societal challenges on the other hand. Perceived overlaps in the Divisions’ activities caused difficulties in the internal division of labour.

While the re-organisation was essentially a top-down decision, there is consensus among both external stakeholders and RCN employees that it was appropriate. Interviews suggest that the reorganisation led to a better thematic focus of research in RCN. This was especially the case for the health area, which was set more firmly within the context of the welfare state. Energy research has also benefitted and received a broader perspective, beyond resource exploitation. Also the centralisation of RCN’s strategic responsibility for the independent research institutes into one single division (the Division of Science) was generally perceived as beneficial.

A majority of our interviewees thought that the internal process for the reorganisation was successful and transparent, and had been carried out with wide-ranging internal consultations. It involved the five trade unions that organise about 50-60% of RCN’s employees.

From a human resources perspective, the process involved

- Individual RCN staff. Each employee affected had an individual meeting on the new organisational affiliation. HR participated in the meeting where any changes affecting the employee’s position was discussed. Department directors who did not have managerial position were offered other suitable work as special adviser
- Teams or sub-departments discussed the changes with line management
- Department meetings on the new structure where the steps in the process were discussed⁵.

One of the organisational consequences of the restructuring was an additional increase in the overall number of employees, above what was originally foreseen. Table 1 shows that even though the Division for Innovation took over a department from the Division for Strategic Priorities, adding 14 new staff members, the two new divisions jointly accounted for more staff members than the previous Strategic Priorities Division. The

³ SAK 26/10 Minutes of the Executive Board meeting, RCN:2010

⁴ *Forskningsrådets egenevaluering*, (mimeo), Oslo: RCN, 2006

⁵ Prosessplan for innbemannning, RCN

growth continued especially for the ERM division, driven by additional tasks related to a significant increase in funding for the ERM area.

Table 1 Trend in RCN staff, 2010 - 2012

	2010	2011	2012
Division for Strategic Priorities	106		
Energy, resources & environment (ERM)		66	81
Society & Health (SAH)		49	59
Innovation div.	105	119	119
Science div.	83	75	80
Admin. div	88	89	89
Director's staff	30	29	29
Total	411	425	455

Source: RCN internal HR data, Stillingsutvikling 2003-2012

3.2 The current organisational structure

Currently, RCN comprises four research divisions, one division for administrative affairs and an Executive Staff organised directly under the Director General (Figure 6).

The 2010 reorganisation increased the responsibility of the Division for Science for the development of the research system and infrastructure, putting it in charge of strategic support to the universities, university colleges and independent research institutes. The Science Division works with all 16 government ministries and has a staff of 80 (2012). Its main concern is funding research using scientific merit as the primary criterion; it is less concerned with supporting policy-related priority areas.

Key instruments include the Centres of Excellence scheme, the Outstanding Young Investigators scheme, and the Support for Independent Projects (FRIPRO) scheme (bottom-up basic research). The Division also funds thematic and strategic basic research programmes and the research infrastructure programme, and oversees the subject-specific evaluations and their follow-up activities as a means of enhancing quality in Norwegian research.

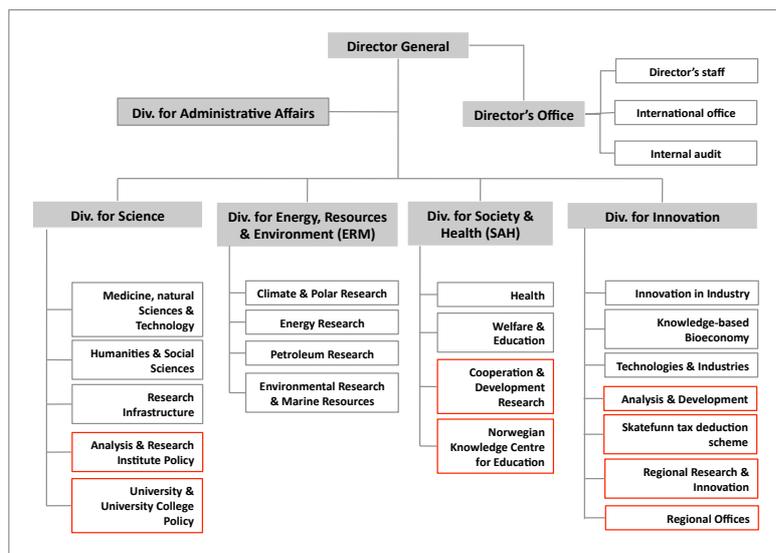
The Division has two thematic departments: the Department for Medicine, Natural Sciences & Technology, and the Department for Humanities & Social Sciences. Together, these departments employ about half the Division's staff.

It also has three departments in charge of the systemic issues.

- The Department for Research Infrastructures, which manages the Research Infrastructures programme (8 employees)
- The Department for University and University College Policy (10 employees), which prepares research policy input on institutional issues for both the sector itself and the relevant ministries
- The Department for Analysis and Research Institute Policy (14 employees) carries out activities relating to the Research Council's strategic responsibility for the research institutes

Only the Science and Innovation Divisions centralised their strategic intelligence and reporting activities in a single department. In the Science Division, the Department for Analysis and Research Institute Policy is also in charge of expanding the knowledge base for all aspects of the division's sphere of responsibility; this includes portfolio analyses, compilation of statistics and reports, and evaluation and analysis in relation to research policy issues. The department also carries out tasks related to budget proposals, budget distribution, reporting, and financial management.

Figure 6 Current organisational structure of RCN



The focus of the **Division for Energy, Resources and the Environment (ERM)** is research and innovation aiding Norwegian and international challenges in the energy, petroleum, climate, polar, environmental, and marine resources sectors. The Division’s key objective is to help to achieve effective, sustainable exploitation of Norwegian resources in order to boost value creation in Norwegian industry. The Division has overall responsibility for coordinating RCNs efforts within its relevant areas of focus, including the High North Initiative. Its activities are supported by 13 of the 16 Ministries (the others are the Ministry of Children and Equality - BLD, the Ministry of Government Administration, Reform and Church Affairs - FAD, and the Ministry of Culture - KUD). All its departments are thematic and cover Energy research, Environment research and marine resources, Climate and polar research, and Petroleum research (employing ~60 staff members).

The Division uses a variety of schemes for its activities, including centres of Excellence (the Centres for Environment-friendly Energy Research - FME scheme), Large-scale research programmes and policy-oriented programmes and funds basic research, user-driven projects, innovation projects and technology demonstrations. It is also responsible for following up the Joint Programming Initiative “Health and Productive Seas and Oceans” and hosts the secretariats for the national strategy initiatives Energi21 and OG21 (Oil and Gas in the 21st century).

The **Division for Society and Health (SAH)** promotes research and innovation within health, welfare, education and social organisation. A main task of the Division is to identify national research needs within its remit and develop policy, knowledge, and research and innovation capacity. The Division works with 15 ministries (all but the Ministry for Transport and Communications - SD).

Policy-oriented programmes are its key instruments. Research is multidisciplinary, ranging from basic research to innovation, and has strong links with research managed in other divisions – especially in the field of biomedical research and welfare research.

The Division has two thematic and two policy departments:

- Thematic departments are the Department for Health and the Department for Welfare and Education (together ~30 staff members)
- The Department for Cooperation and Development Research (~10 employees) manages and coordinates the bilateral research cooperation activities. Priority

countries are the US, Canada, Russia, Japan, China, India, South Africa, Argentina, Brazil and Chile

- The recently established 'Norwegian Knowledge Centre for Education' (1 employee) was established on a commission from the Ministry of Education and Research to present, summarise and disseminate results of Norwegian and international educational research

The **Division for Innovation** funds research within and for the Norwegian industry and has overall responsibility for the innovation system. It works for all the ministries except the Ministry of Petroleum and Energy. It provides funding support to individual companies, research institutes, and HEIs, for the commercialisation of research findings, network building and specialised centres. Division instruments include the SkatteFUNN tax deduction scheme, the programmes for User-driven Research-based Innovation such as the BIA, Food Programme (MATPROGRAMMET), the Innovation Programme for Maritime Activities and Offshore Operations (MAROFF) and the Programme on Intelligent Freight Transport (SMARTRANS). It also runs the EUREKA's Eurostars Programme in Norway, the Industrial PhD Scheme, the Centres for Research-based Innovation (SFI) scheme, and linked to its responsibility for regional research and innovation, the Division manages the programme for Regional R&D and Innovation (VRI).

Since 2010, the division has expanded its programme portfolio with three Large-scale programmes covering ICT, nanotechnology and biotechnology areas ie VERDIKT, NANOMAT and FUGE.

The Division has three thematic departments.

- The Department for Bio-economy, focusing on innovation and industrial development related to biotechnology, ~ 20 staff members
- The Department for Innovation in Industry, managing the funding scheme for user-directed research, ~20 employees
- The Department for Technologies and Industries (~20 employees), responsible for basic and industry-oriented research in ICT, nanotechnology, new materials, transport and maritime challenges.

Two additional departments cover the tasks related to regional research and innovation.

- The Department for Research Council Regional Offices, coordinating the 13 regional offices that cooperate with the Innovation Norway district offices
- The Department for Regional Research and Innovation, which coordinates RCN's regional activities (~30 staff members)

The Department for SkatteFUNN (~15 staff members) oversees RCN's support to the tax deduction scheme, implemented in cooperation with Innovation Norway.

Finally, the Department for Analysis and Development (~15 employees) is responsible for strategy development, analysis and communication functions in addition to financial management activities within the Division for Innovation. The department conducts analyses and draws up reports and studies of various types to gain insight into how RCN activities target social challenges. The knowledge about innovation that emerges, along with the dialogue with stakeholders, forms the foundation for strategic planning activities within the division.

The **Division for Administrative Affairs** supports the other divisions with overall coordination, management and organisational development. Its main task is to provide administrative and technical infrastructure and support to both internal and external users. Its responsibilities also include organisational support, with an emphasis on learning, job fulfilment and good working conditions, and the introduction of Internet-based R&D administrative procedures.

Departments are the IT department (~15 employees), Finance (~15), Communication (~20 employees), Legal affairs (~5), HR (~10), Documentation & joint services

(library/archive management, ~20 employees). The division also handles secretariat tasks for the Research Council Executive Board and the director's management group.

Grouped under the **Director's Office** are

- The Director's Staff, which coordinates activities relating to budget planning, annual reports, statistics, strategic initiatives, and media contact (~15 staff members). It oversees and coordinates the activities of the cross-divisional working groups
- The International Office (~15 employees), which has the responsibility for the coordination of international activities and key responsibility for the cooperation at European level
- The Internal Audit unit (3 employees)

3.3 Co-ordination within RCN

In our 2001 evaluation, we considered that there were clear issues in the internal coordination and inter-divisional collaboration within RCN. We stated,

There are two forms of cross-divisional co-ordination in RCN: 'strong' co-ordination, via the budget; and 'weak' co-ordination, via inter-divisional groups and activities. There are almost no examples of strong co-ordination, with budgets being jointly managed across division borders. Weak co-ordination takes place in two ways: thematic committees; and in fora, focused mostly on processes. While the administrative fora have clearly helped in process development and standardisation internally, we saw little evidence that they affected research policy.⁶

This situation has drastically changed, triggered by the launch of the Large-scale programmes. Not only is there now 'strong' coordination in place, the 'soft' coordination cross-divisional working groups and fora have considerably expanded their activities and currently form the basis for many management processes - amongst others, the development of the budget proposals and annual reports to the Ministries.

3.3.1 A horizontal and vertical structure

In the operational structure of RCN, all managing officials at the various levels have responsibilities for communication and cooperation with the other divisions, departments or other relevant activities as well as with initiatives outside RCN

- The *Division Director* has overall responsibility for the management of the division, including the division's programme portfolio, planning and monitoring processes and the evaluation of relevant programme initiatives. He/she should also ensure coordination with the other Divisions.
- The *Department Director* has the responsibility to facilitate, develop and monitor the administration of the programmes included in the department's portfolio. He/she especially facilitates the establishment of relationships with relevant adjacent activities in- and outside the Research Council.
- The *Programme Coordinator*, together with the other programme management staff, is responsible for the daily operation and the implementation of the Division's programmes or schemes. Apart from the services to the Programme Board and other administrative tasks, he/she should also ensure good contact and coordination with related activities in RCN, consider participation in relevant international activities within the area and create awareness and interest in the programme among relevant target groups or applicants.

⁶ Barend van der Meulen, James Stroyan, *Internal Functioning of RCN*, Background report nr. 8 in the evaluation of the Research Council of Norway, University of Twente – Technopolis Ltd, 2001

The *Directors' Meeting* (DM) is an essential tool for the Director General to distribute tasks and to discuss matters related to the organisation of work processes, management and organizational development, and research policy. DM has one meeting a week, in which the heads of the divisions, the international unit and the Director's staff participate. Right before or right after the DM, there are management meetings at the *Division level* to discuss matters raised in the DM. Regular meetings are held with at *departmental level* the same aim.

In its 2006 self-assessment, RCN considered a stronger internal cohesion and cross-divisional collaboration to be a critical factor for strengthening its capacities in fostering cross-sector and cross-disciplinary cooperation as well as fulfilling its role as advisory body in relation to strategy and policy development.

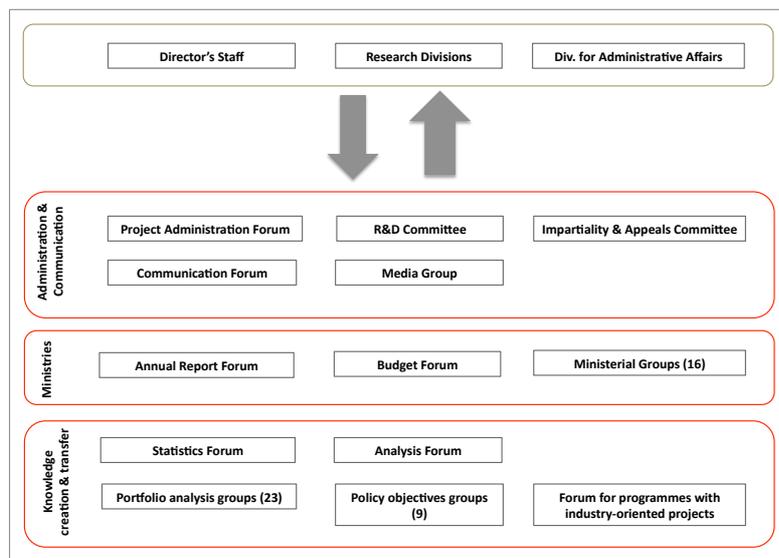
For this purpose, RCN has developed a horizontal management structure consisting of 42 cross-divisional working groups – in addition to the vertical division structure.

Working groups across divisions existed already in the beginning of the 2000s and in our 2001 evaluation we considered these to be a case of 'soft' coordination, generally producing few concrete results. Many of the current groups seem to have more impact and are firmly embedded in the overall procedures for strategy and programme design, programme management, budget proposal development and reporting to the ministries. Some of these groups, such as those associated with budgets and national priorities, work intensively; others meet only from time to time and have a less formal character. Some working groups have stopped functioning, such as the evaluation group and the K2, a working group intending to enhance knowledge-based strategic intelligence development. Others are gradually taking up a stronger position in the overall RCN administration structure. Examples are the R&D working group responsible for the standardisation of working procedures (the 'R&D Committee'). Recently, a full-time director has been nominated to manage international cooperation, who will *inter alia* be supported by the work of the IKU group.

The mandates of these working groups point to a decentralisation of many functions in RCN management. This includes programme design and aspects of strategy as well as support functions such as statistics and communication. The groups fall into three main categories.

- Working groups with administration and communication functions, ensuring standardisation of administrative procedures, development of statistics and indicators, Council communication etc
- Working groups that coordinate the relationship and communication to the Ministries, ie the development of budget proposals and the annual reporting to the Ministries
- Working groups that facilitate the creation of strategic intelligence and the internal transfer of knowledge

Figure 7 Mapping of the cross-divisional working groups



These working groups illustrate the importance attributed in RCN to the creation of a “crosscutting (‘transversal’) as well as distributed knowledge base” that would “systematically guide and support the Council in all its activities”.⁷ They involve half of the total staff in RCN (at the individual level, i.e. 228 employees) - more specifically, 65% of staff in the Science Division, 60% in the Innovation Division, and 55% in the two other research divisions and the Director’s staff. Approximately 40% of these individuals are involved in more than one working group.

Overall, RCN interviewees were positive about the working of these groups, even though it was recognised that they were resource-intensive and in some cases the need for ‘everybody to know everything’ was questioned. The large size of some of these working groups was sometimes criticised, suggesting that they were cross-department rather than cross-division.

3.3.2 Description of the cross-divisional working groups

The working groups involve all Divisions, with the Director’s staff acting as the main coordinating body; in the case of the working groups for the internal transfer of knowledge, the responsibility for the operational work and reporting of the groups is delegated to the director or senior adviser in a specific division.

The Director’s staff most often heads working groups with strategic, administrative and communication tasks. Exceptions are the Impartiality and Appeals Panel, headed by a member of the Division for Innovation, and the Project Administration Forum, led by the IT department in the Administration Division.

- One group with a central role in the current RCN administration is the R&D Committee (11 members), which defines the administrative policies and standardises procedures and guidelines. The current group is a merger of two previous groups with overlapping functions. Tasks of this group include the development of standardised procedures (*Rådgivere*), templates and guidelines and their updates, the needed information to ensure awareness and the correct understanding of policies and guidelines throughout the organisation, and the

⁷ RCN, Kunnskapsbaserte råd, virkemidler og møteplasser: Policy for Forskningsrådets arbeid med kunnskapsgrunnlaget – med fokus på det tverrgående kunnskapsgrunnlaget, Oslo: RCN, 2011

overall responsibility for the implementation of and compliance with the guidelines.⁸

- The Project Administration Forum (PAF – 22 members) focuses on IT skills and the delivery of support for RCN's IT Systems. It is led by an IT department employee (Administration Division) and comprises of members from each division who are expected to act as the link between the IT department and the users - in the Divisions as well as externally.⁹ Meetings are monthly and are an opportunity for dialogue about needs, issues and suggestions for improvement, as well as to provide eventual training in the changes in the specialised systems.
- Two cross-divisional working groups focus on the Council's communication: the Communication Forum (K-forum – 7 members), which coordinates RCN communications and meets every two weeks, monitors the RCN communications strategy and prepares communication statements for the DM (Director's Meeting). The Media Group (11 members) plans and coordinates news stories for RCN's website and social media. It is also in charge of the editorial planning of RCN's Intranet and prepares financial information on RCN - in coordination with the R&D Committee.
- The Impartiality and Appeals Panel (HAK – 6 members) is an internal advisory body, chaired by a member of the Division of Innovation but organisationally located under the legal department in the Administration Division. It assesses questions and complaints associated with applications for research funding and can be consulted for advice and assistance in advance of the final decision-making on impartiality issues. The Panel is also expected to play an active role in the exchange of experience, cooperation and learning in connection with impartiality and complaints issues. It provides feedback to the R&D Committee for improvements of existing internal policies and practices.

Director's staff members chair the two working groups coordinating the proposal writing and reporting to the Ministries

- The Budget Forum (9 members) is responsible for the development of the annual budget proposals, building upon the input provided by (amongst others) the Portfolio and Priority (FM) Groups, the Directors' meeting and senior experts in the divisions, and the Ministry groups. It is in particular responsible for the development of the first internal proposal for strategic priorities funding, based on government White Papers, the national budget, allocation letters from the ministries, the Research Council's strategy and action plans, along with various decisions made in RCN's governing bodies¹⁰
- The Annual Report Forum (11 members) supports the Administrative Division in the development of the annual reports, taking care in particular of the first general section of the report (see the background report on Strategic Intelligence – WP1). The sections concerning the various Ministries are handled by the specific Ministry Groups

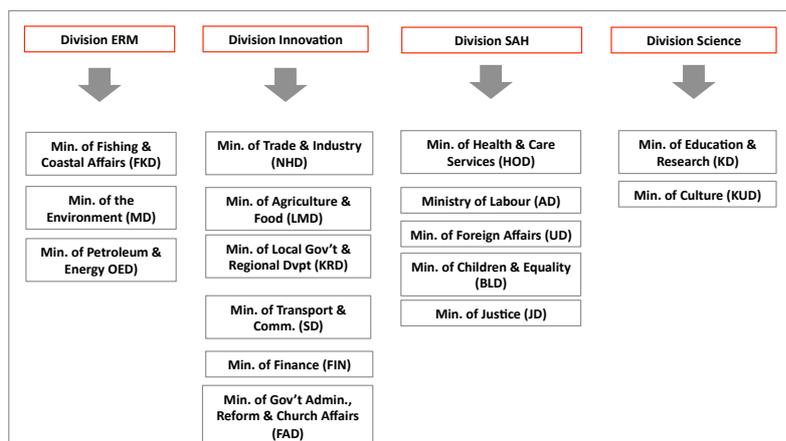
The system of ministry responsibility ensures that a single Division is made responsible for the dialogue with any given Ministry and heads the 'Ministry groups' (about 60 members - Figure 8), coordinating representatives of the other Divisions receiving funding from that Ministry. The director of the responsible Division is the formal chair, while a senior colleague in the same Division is operationally responsible. These groups play a crucial role in the reporting to the Ministries: the responsible Division has overall responsibility for drafting the sections in the budget proposals for the specific Ministry and is in charge also of the mid-year and annual reporting, including the formal meetings.

⁸ Notat: Bakgrunn og Mandat for FoU-utvalget C-1-13, RCN: 2011

⁹ Notat: Mandat for PAF, RCN: 2011

¹⁰ Rådviseren B-2-01 Budsjettforslag, RCN: 2011

Figure 8 Ministry responsibilities of the Divisions



Source: RCN data, 2012

Finally, there is a set of working groups focusing on the development and internal transfer of strategic intelligence.

Two of these groups have overall responsibilities for the development of quality statistical analyses and are headed by the Director's staff.

The Analysis Forum (10 members) has primary responsibility for the coordination of cross-divisional knowledge creation and transfer within RCN. Its specific tasks are to ensure the coordination and exchange of information on the status and plans for work on the knowledge base in the Divisions and the Director's staff, as well as relevant external fora where Research Council participates. It particularly focuses on areas of evaluation and measurement / indicator development, including links to national and international indicator development, and hereby complements the work of another cross-divisional working group, the Statistics Forum, which focuses on more operational aspects. All divisions and the international office participate in this forum by means of a 'permanent representative' (director or senior employee) that is central to the division's work on knowledge base and an advisor. The forum meets at least twice per 6 months.

The Statistics Forum consists of 13 members from all divisions. Its role is to ensure the quality and appropriateness of content of the existing indicators and registration systems; create guidelines and decide on indicators to be monitored; facilitate the development of standard reports; identify new statistical and analytical needs; and recommend / implement measures to improve the availability of statistics - in close cooperation with the R&D Committee.

Some 33 cross-divisional working groups focus on knowledge creation and transfer for the development of programmes and programme action plans, strategies, budget proposals and annual reports (Figure 9). Together, these groups involve 152 individual employees, some of them active in more than one group. This accounts for approximately 50% of the employees in the Science Division and 40% in the three other research divisions.

- Nine working groups focus on the national strategic priorities (so called FM groups). These groups contribute to RCN's implementation of the national research policy and are in charge of monitoring RCN's activities related to the key priorities set out in the latest White Paper Climate for Research. They have responsibility for providing input to RCN's annual report and evaluations of the Research Council's overall activity and are also expected to input to the annual budget proposals, specifying technical and research challenges and contributing to the definition of priorities and the design of activities. Members of these groups are Department Directors or Senior Advisers; normally, the groups have between three and six members

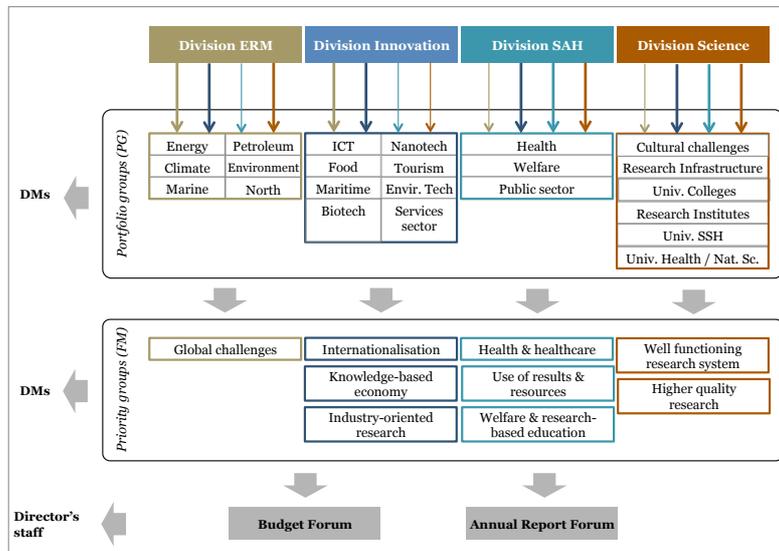
- The work of the FM groups builds upon the activities of the 23 Portfolio Groups (PG) that focus on scientific and technological areas related to the thematic priorities (18) and structural objectives (5) stated in RCN's strategy. The PGs support the FM groups especially by conducting annual portfolio analyses that form the basis for the FM groups' work on the annual report and budget proposal. They also contribute to other reports, publications and presentations by the Research Council and are involved in strategy development for their areas. The groups can consist of one or two members per Division, possibly more if considered appropriate

A special case is the IKU group, which is a cross-divisional working group for coordinating international operations within RCN, and at the same time fills the role as a FM-group (on the main goal of internationalisation). IKU coordinates initiatives and decisions and considers policy issues. It works operationally with international cooperation, mostly focusing on Europe (ERA). The responsibility for the bilateral international cooperation is placed in the SAH division. In contrast to the other FM groups and the PG groups who meet 3 to 4 times a year, this group meets every second week.

Responsibility for the various FM and PG groups is given to specific Divisions, based on their overall mandate. The responsible Division (Director or Senior Officer) controls the quality and progress in the group's work and ensures that the necessary resources are made available. The groups report through the Director of the Division responsible.

Figure 9 illustrates the specific responsibilities of the Divisions in this context as well as their level of involvement in the groups directed by the other Divisions.

Figure 9 The Divisions and the Strategic Priorities & Portfolio Analysis Groups



Source: RCN, 2012

We observe the following.

- The Division of Innovation is particularly active in the cross-divisional knowledge transfer. It is involved in all working groups, taking up responsibility for 3 FM groups and 8 out of the 18 thematic priority Portfolio groups
- The Science Division focuses its attention in particular on the Portfolio groups covering the structural priorities, in line with its responsibilities in the RCN organisational structure. Two of its Portfolio Groups focus on scientific disciplines (Social sciences & Humanities and Health & Natural sciences)

- The Science Division and Division for Innovation are involved in all working groups directed by the two new divisions (ERM and SAH). We note a particularly strong involvement by the Innovation Division in the Energy and Climate portfolio groups, led by the ERM Division
- The ERM Division is involved in all groups headed by the Innovation Division, while only in some directed by the other divisions. We see the same pattern emerging for the SAH Division, participating in all groups headed by the Science Division

The picture emerging is one of tension between the thematic responsibilities - in particular for the Innovation and ERM Divisions. Not only do these divisions share numerous cross-divisional Portfolio Groups, they also felt the need to set up a specific cross-divisional working group - the Forum for industry-oriented projects (NP forum) - involving 14 staff members of the Division for Innovation and 5 of the ERM Division, at the level of programme coordinators. This forum usually meets once a month; its objective is to exchange experiences and learning, and reach an improved cooperation among the programmes.

3.4 Financial and Human Resources

3.4.1 Research and administrative budgets

The Ministry of Education and Research (KD) provides RCN with an administrative budget to cover its operational costs; together with 15 other Ministries it also provides RCN with a research budget. Part of this research budget is intended to cover management costs.

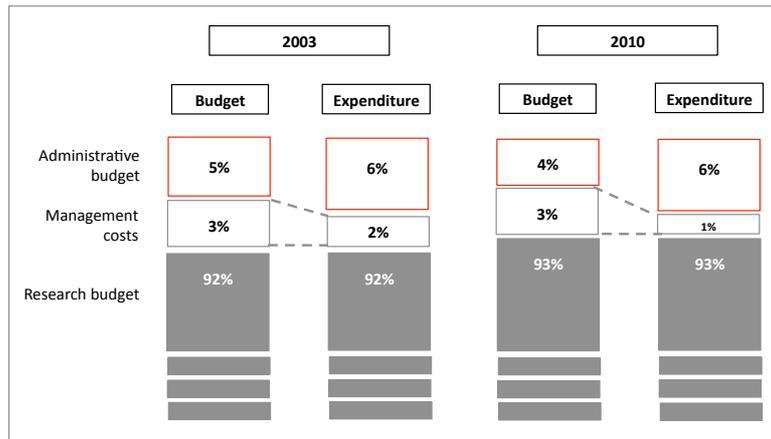
Compared to the beginning of the 2000s, we note the following changes in RCN's overall income (based on Ministry funding) and the distribution over the different budgets:

- In real prices (fixed 2000), the administrative budget has essentially remained stable throughout the decade, while the research budget increased of 60%
- In 2000, 4% of the research budget was intended to cover management costs; this was reduced to 3% as of 2003

Thus, the overall increase in Ministry funding of research through RCN was only partly accompanied by an increase in funding of the management costs. Nevertheless, RCN kept its administrative income stable at 6% of the overall income. It did so by transferring to its administrative budget increasing shares of the part of the research budget intended to cover management costs. In 2003, RCN transferred one quarter of the budget for management costs; in 2004 and 2005 half, as of 2006 two thirds were transferred. As a result, the share of the 'external' management costs (included in the research budget) in RCN's overall expenditure decreased from 2% in the 2003 to 1% as of 2006. Figure 10 illustrates this process.

As of 2004, ~93% of RCN's overall budget was devoted exclusively to funding research, compared to 91% in 2000.

Figure 10 Share of the cost categories in RCN overall budget & expenditure

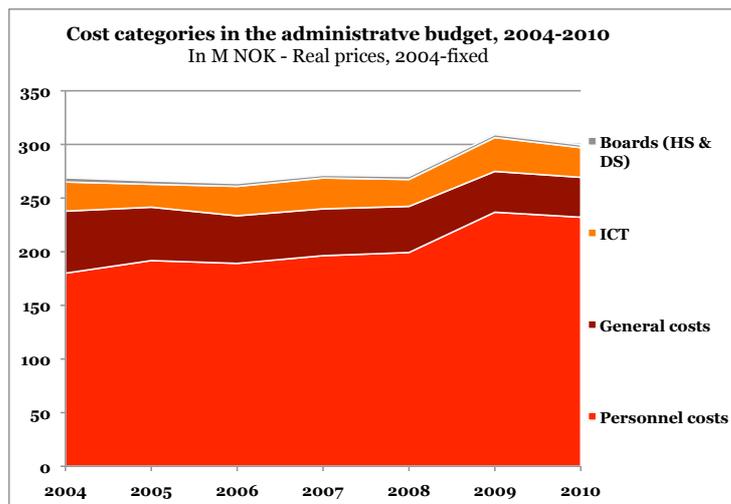


Source: RCN data, 2012 – Technopolis analysis

Administrative budget

The breakdown of RCN’s administrative budget shows that the effective increase in the administrative budget was predominantly used to cover the rising personnel costs – throughout the decade and in particular in 2009. In 2010, personnel costs accounted for 77% of the administrative budget, compared to 67% in 2004.

Figure 11 Breakdown of the RCN administrative budget



Note: RCN was able to provide these data only from 2004 onwards

Source: RCN data, 2012 – Technopolis analysis

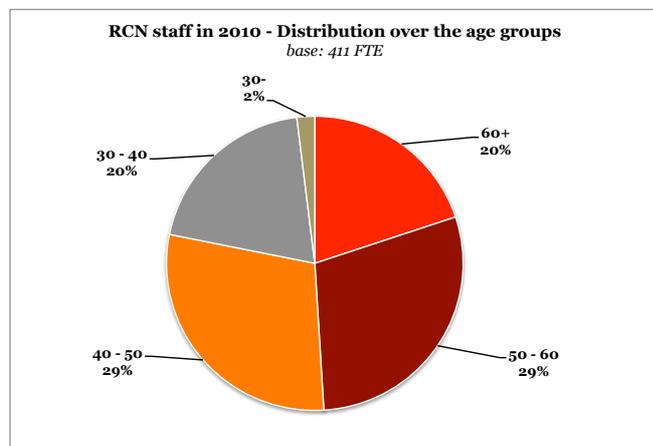
3.4.2 Human resources

RCN currently has a staff of 455 members; in 2010, there were 411 employees (Full Time Equivalent – FTE).

RCN’s employees are overall highly educated. Close to 90% have at least a BA diploma or equivalent, about 50% have a masters degree or equivalent, and 15% have a PhD. Consultations in this study overall praised the competence of RCN’s employees as well as their commitment.

The staff is ageing. In 2010, half of the employees were 50+; only 20% were less than 40 years old (Figure 12).

Figure 12 Age categories in RCN staff, 2010



Source: RCN internt notat, 2011 – Technopolis analysis

Detailed historical data on this topic were not retrievable from RCN documents. However, the trend in job titles – and in particular the increase in number of Special Advisers (*Spesialrådgiver*) in 2011 compared to 2003, also suggests a trend of staff ageing.

Table 2 Job titles and employees (FTEs) in 2003 versus 2011

		2003	2011	2003	2011
Direktører samlet	Total directors	42	39	13%	9%
Direktører/divisjonsdir.	Director/division directors		6		
Direktører - prosjektdirektører og direktører	Director - project directors & directors	8	6		
Avdelingsdirektører	Department directors	24	26		
Seksjonsledere	Section leader	10	1		
Høyere saksbehandler	Higher-level officers	183.2	310.2	58%	73%
Spesialrådgiver gruppe 8	Special adviser - group 8	42.5	20.4		
Spesialrådgiver gruppe 7	Special adviser - group 7		97.7		
Seniorrådgiver	Senior adviser		130.5		
Rådgiver gruppe 6	Adviser group 6	140.7	41.2		
Rådgiver gruppe 5	Adviser group 5		20.4		
Lavere saksbehandler	Lower-level officers	89.3	79.1	28%	19%
Seniorkonsulent	Senior consultant		55.1		
Konsulenter	Consultant	78.3	24		
Tekniske stillinger	Technical staff	11			
	TOTAL	314.5	427.5	100%	100%

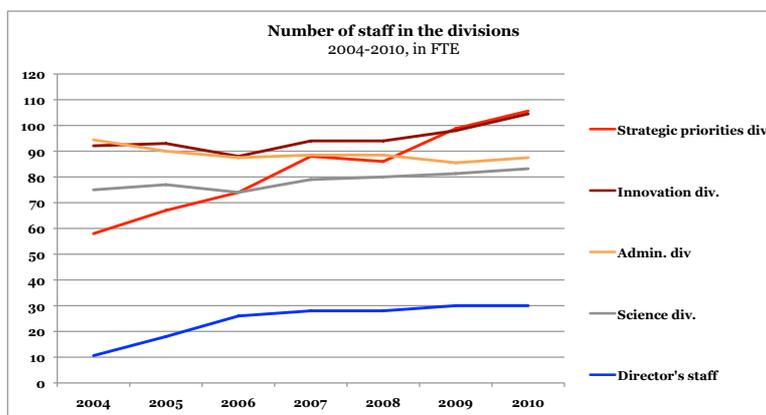
Source: RCN annual reports 2003 and 2011

In the last decade there was a significant increase in personnel in RCN, from 330 employees in 2004 to 411 in 2010. All Divisions' employment rose (except the Administration one), in particular the Division for Strategic Priorities, (from 58 in 2004 to 106 in 2010) and the Director's office (from 11 in 2004 to 30 in 2010) (Figure 13).

This was combined with a limited level of staff turnover (4% in 2010). It was predominantly thanks to the latest increases in staff that more than half of the staff

(60%) had less than 10 years service in RCN in 2010; at the other end, 20% had been working in RCN for more than 20 years¹⁴.

Figure 13 Number of staff in the divisions (in FTE)



Source: RCN data, 2012 – Technopolis analysis

According to RCN, the limited staff turnover implies that the gender balance in the workforce is a permanent organisational challenge. Nevertheless, the proportion of women has increased in recent years (close to 80% of new recruits were women) and in 2010, women represented 63% of the RCN workforce (Table 3).

The proportion of women among managers was 55%, the consultant group was 57% female, while women constituted 90% of consultants / senior consultants. In the individual units, the proportion of female personnel was 62% of the Director's staff, Administration division 58%, Innovation division 56%, Strategic Priorities Division 59% and the Science division 70%.

Table 3 Gender equality in RCN staff

	% of female employees	% of male employees
2006	60.5	39.5
2007	60.6	39.4
2008	60.1	39.9
2009	60.9	39.1
2010	62.9	37.1

Source: RCN internt notat, 2011 – Technopolis analysis

The trend in personnel and allocation of budgets for the operational costs depicted above are closely related to the rise in workload and responsibilities to which RCN was subject in the last decade. The rise in budget inevitably implied an increase in proposals and projects to be managed; RCN was given additional tasks related to, for example, the regional research funds, and the importance of international co-operation in research came ever more on the forefront of RCN's actions. Growth in sectoral and cross-disciplinary research, combined with RCN's need to act as advisory body, led to an increasing need for internal knowledge transfer.

Like most funding agencies in Europe, RCN implemented measures that could reduce its workload and enhance efficiency. It rationalised its programmes into a smaller number of larger ones, increased the size of the projects, standardised project and proposal management procedures and increasingly used ICT in the management of its activities. The number of programmes or schemes was reduced from 229 in 2003 to 178 in 2010 (Table 4). This especially affected the basic research and policy-oriented research programmes and the schemes for the funding of independent research

¹⁴ Internt notat 14.04.2011 - Nøkkeltall og utfordringer knyttet til ressurser, kompetanse og øvrig personalstatistikk for 2010, RCN: 2011

(bottom-up funding). The only countertrend was for international research where the portfolio saw a considerable expansion.

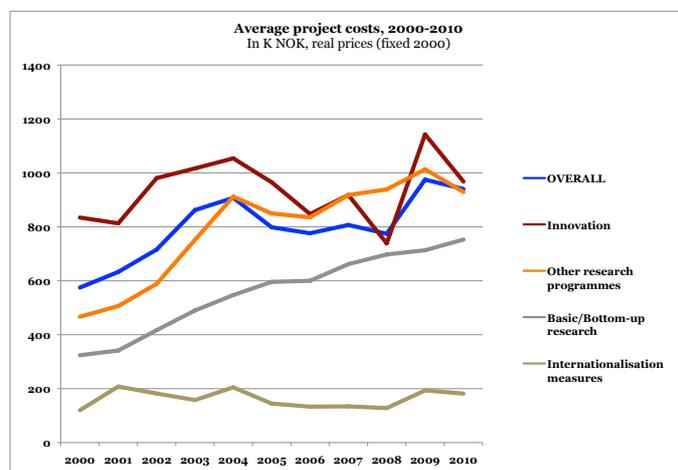
Table 4 Number of programmes/schemes in the instrument groups (Virkemiddler), 2003-2010

	2003	2004	2005	2006	2007	2008	2009	2010
Programmes	97	81	79	74	75	72	63	62
Independent projects	59	53	53	47	44	39	39	41
Network building measures	16	20	21	23	23	23	25	25
Overall	229	210	218	203	197	193	181	178

Source: RCN data, 2012 – Technopolis analysis

There was also a considerable increase in mean project cost - overall and for the different competitive funding research lines. This is closely related to the strategic choice to fund more collaborative research and to prioritise the funding of projects rather than individual grants - also in bottom-up basic research. The average project cost was 862.1 K NOK in 2003 (competitive research funding, real prices), compared to 940.4 K NOK in 2010.

Figure 14 Trend in average project cost, 2000-2010



Source: RCN data, 2012 – Technopolis analysis

RCN also made significant efforts to standardise its administrative procedures and now has a broad set of electronic systems in place that facilitate tasks related to administration, programme and project management, and the production of general statistics and management information.

The increase in personnel, combined with the efficiency enhancing measures, more than absorbed the increase in workload (Table 5). Since 2004, there has been a slight reduction in average workload per employee in terms of budget for which each employee ‘accounted’ (real prices) and from 2009 onwards there was a drop in number of projects per employee. The number of proposals to handle also declined.

Table 5 Research budget per FTE, 2004-2010

	2004	2005	2006	2007	2008	2009	2010
Total FTE	330	345	350	378	377	394	411
Total budget – in M Nok*	4061	3897	3914	4483	4362	4958	4843
Total nr projects	4130	4505	4654	5128	5198	4692	4754
Total nr proposals**	6135	6511	6661	7136	7207	n.a.**	n.a.**
Budget/FTE	12.3	11.3	11.2	11.9	11.6	12.6	11.8
Projects/FTE	12.5	13.1	13.3	13.6	13.8	11.9	11.6
Proposals/FTE	26.5	24.4	21.7	20.1	18.3	n.a.	n.a.

Notes: * Real prices – Fixed 2004; **data on proposals are to be considered proxies at a year-to-year level; data on 2009 and 2010 could not be included due to the low quality of the data provided by RCN

Source: RCN data, 2012 – Technopolis analysis

Nevertheless, in the previously mentioned internal document on personnel issues¹⁵ the Administration Division personnel continue to indicate high levels of workload. Work time data show that this is particularly true for staff members at managerial levels. The Division concludes that this should be monitored at management level and organisational level and that the issue should be investigated more in detail to identify remedial measures.

3.4.3 Time against tasks

In 2011, the RCN administration started implementing an internal resource management system that should lead to better understanding of time allocation and improved resources management. A matrix was developed covering specific tasks, grouped around three major categories reflecting RCN's main functions:

- Funding of research. This includes all tasks related to a specific programme or scheme/R&D activity such as programme design and development, call management, monitoring and reporting, communication, strategic advice, evaluation, conferences and work shops, participation in international fora related to the initiative, and financial control
- Advisory function. Grouped under this category are activities that are not specifically related to a single programme/scheme, notably the creation and communication of strategic intelligence, including the management of evaluations, development of knowledge, budget planning and overall strategy design, strategic communications, and cross-divisional working groups
- Meeting places, ie organisation and/or participation in national or international conferences, seminars, networks or committees
- Administration, including HR management, ICT, budgeting, internal communication, internal meetings or seminars etc.

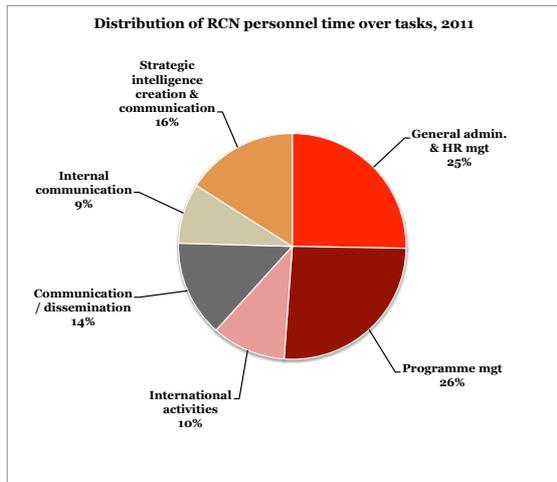
According to these time sheets, RCN personnel spent overall 40% of its time for the tasks related to 'Funding management' of specific programmes or schemes, close to 35% on general Administration tasks, nearly 20% on the Advisory function, and 8% for participation in Meeting places.

For the purpose of this evaluation, we grouped the various tasks into slightly different categories, in particular omitting the distinction between programme-specific and other activities. From this analysis (Figure 15) results that, according to these time sheets

- RCN personnel used about 25% of their time in the creation and communication of strategic intelligence - to the Ministries (budget proposals and annual reports) and internally (internal communication, including the cross-divisional working groups)
- The management of international cooperation activities took up 10% of the time
- Programme management activities (from planning to monitoring and reporting) accounted for 25%
- Participation in national 'meeting places' for communication and dissemination purposes took up 15% of the time

¹⁵ Internt notat 14.04.2011 - Nøkkeltall og utfordringer knyttet til ressurser, kompetanse og øvrig personalstatistikk for 2010, RCN: 2011

Figure 15 Time allocation against tasks, 2011

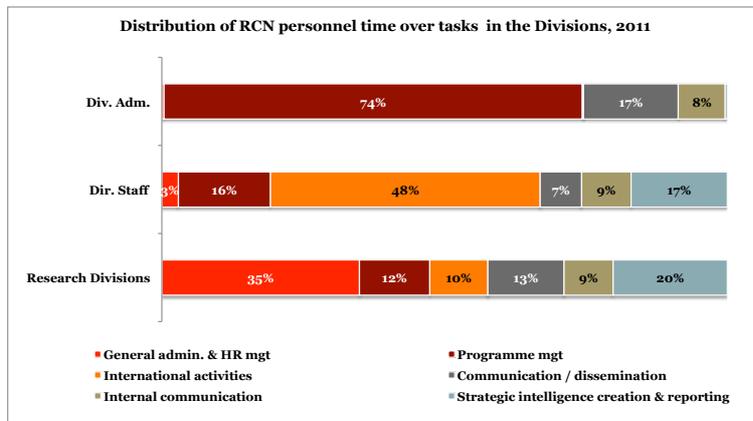


Source: RCN data, 2012 – Technopolis analysis

The focus in the various divisions reflected their specific mandate (Figure 16):

- The Director’s staff was particularly involved in the internationalisation activities (about 50% of time spent)
- The research divisions dedicated their time especially to the operational Programme management tasks (35%) and the creation and transfer of strategic knowledge (internal communication and strategic intelligence creation and reporting – jointly about 30% of time spent).

Figure 16 Time allocation against tasks in the divisions, 2011



Source: RCN data, 2012 – Technopolis analysis

As mentioned in Section 3.3.1, the quality of these data is questionable and some experience should be gathered before they can actually serve as basis for management decisions. Data on task allocations against time are also not available at this level on the international scene, nor is there historical data within RCN with which to compare.

At this point, we can only consider these data to illustrate the strong importance attributed to internationalisation in RCN, the apparent efficiency in programme management, and the considerable amount of time spent on knowledge creation, transfer and reporting - internally and to the Ministries.

3.5 The stakeholder committees

As at the beginning of the 2000s, RCN had a very large ‘surface area’, communicating with a large number of authorities, users and the research communities. Approximately 1,500 individuals participated in various boards, advisory groups and

committees over the period of analysis (2003-2010), a number that is reducing in the later years due to the rationalisation of the programmes.

The profile of these stakeholders involved overall reflected the responsibilities of the various divisions. However, the involvement of research institutes and university colleges was limited, pointing to a possible difficulty for RCN in going beyond the usual suspects.

Positive trends are the increased involvement of foreign experts in the programme management processes and the movement towards a more balanced representation of the different regions and genders.

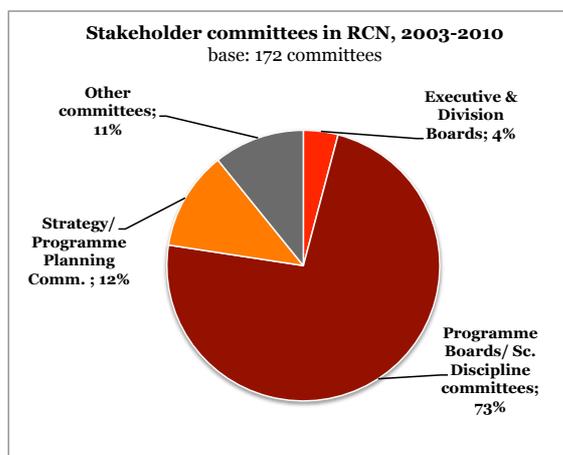
3.5.1 Overview of the committees

In the period 2003-2010, RCN set up in total 172 boards and committees; the majority of these (~70%) were programme boards or scientific discipline committees (Figure 17).

About 20 committees supported RCN in the development of strategies or programmes – in particular in the Innovation and Science divisions. Other committees provided input to RCN about international cooperation opportunities (in the Strategic Priorities Division), supported the management of specific funds such as the Skogfond, or focused on dissemination or evaluation.

Stakeholder involvement was particularly intense in the Science Division, accounting for close to half of the 131 committees (64). Each of the two other research divisions installed ~30 committees.

Figure 17 Type of committees or boards - 2003-2010



Source: RCN Committees database, Technopolis analysis (2012)

3.5.2 Profile of the stakeholders involved overall

In total 1,541 individuals participated in these committees, on average in 1.6 different committees – a number suggesting that RCN succeeded in limiting the involvement of the ‘usual suspects’ at an individual level.

The reduction of the number of programmes in recent years implied a decrease in number of individuals involved. In 2010, 45 Programme Boards and Scientific Committees were active, involving ~300 individuals, compared to the 80 Boards/Committees in 2004, involving ~700 individuals.

Research stakeholders are the most strongly represented (close to half of the individuals involved) – predominantly active in the universities; nearly one third of the individuals were active in user organisations, with the private and public sectors at

close to equal levels (~15% each), and foreign experts represented 16% of the total individuals.

Data on participations show a similar pattern. There have been total of 1,817 participations over the period 2003-2010. Participations by researchers account for ~50%, while user participations and foreign participations represented 17% and 15% respectively.

The profile of the stakeholders involved at the level of the divisions (Table 6) illustrates

- The prominent role of the university representatives in the Science Division, in line with the positioning of these institutions in relation to basic research
- The considerable contribution of the industry sector to programme development in the Innovation Division
- The more distributed stakeholder basis in the Strategic Priorities Division and the significant involvement of the public sector, compared to the other divisions

Table 6 Stakeholder involvement in the committees

		Strategic Priorities Division	Innovation Division	Science Division	Total
Research	University	24%	15%	54%	33%
	Institute Sector	15%	10%	7%	10%
	Univ. Colleges	4%	4%	3%	4%
Users	Industry Sector	7%	38%	4%	16%
	National PA	16%	9%	3%	8%
	Public Agency	11%	6%	2%	6%
	Regional/Local PA	2%	4%	1%	2%
Other	Foreign experts	17%	5%	24%	16%
	Other	4%	3%	1%	3%
	N.A.	0%	5%	1%	2%
Total		100%	100%	100%	100%
		474	573	693	1,740

Notes: excludes the Executive and Division Boards

Source: RCN Committees database, Technopolis analysis (2012)

A major consideration is the involvement of the institute sector, which is limited when considering the important role of this sector in RD&I system – especially in relation to applied research. Interviewees attributed this less-than-expected involvement of these research actors to the implementation of the Conflict of Interest rules by RCN – often considered to be too rigid. However, we see limited involvement of these actors also in the strategy/programme planning committees, in particular in the Innovation Division. A similar observation can be made in relation to the university colleges, taking into account the political importance attributed to a more pronounced involvement of these institutions in research.

Some major trends can be noted in the 2003-2011 period, overall in line with developments in the RD&I system

- A major change in the Science division was the considerable increase in involvement of foreign experts, who more than doubled their share from 2006 onwards
- The Innovation Division saw an increase in participation from higher education institutions (from 19% of the total in 2003-2005 to 23% in 2011). This was especially due to an increase in involvement of researchers active in universities, reflecting the increased focus on applied research in these institutions
- Across all divisions, there was a considerable decrease in the involvement of public administration in the second half of the decade (ministries, regions or town councils - from 16% of the total in 2003-2005 to 7% in 2011. This is closely related to the agreement reached in 2009 that limited ministry participation in Programme Boards to those programmes where the specific Ministry is a core funder, ie primarily policy-oriented programmes. In that case, Ministry representatives can participate in all discussions, but have no voting right on

individual project applications. In special cases, ministries may participate also in other Programme Boards, but only with the status of observer¹⁶

Data on the period 2003-2010 show little direct involvement by the funding ministries in committees involved in strategy development, even at a programme level. This reflects a decision to separate the political and policy level from the agency or implementation level, in line with modern administrative practice.

- Ministries were involved predominantly in committees related to programme management and international cooperation; all of the 16 Ministries were involved in at least 1 Programme Board
- Only 3 out of the 16 ministries participated in committees focusing on strategy or programme development, i.e. the Fisheries and Coastal Affairs Ministry, the Ministry of Agriculture and Food, and the Ministry of Government Administration, Reform and Church Affairs
- Only 1 Ministry, the Ministry of Agriculture and Food, was represented in a Division Board (in the Division of Innovation)

This constituted a change with previous practice. Data on the committees running in the period 2000-2002 show involvement by ten ministries in strategy/programme development committees - and the NHD, MD and the regional development ministry in several.

One of the research policy trends in the last decade was the desire to support more research at the **regional level** and we note a positive trend in stakeholder involvement from that perspective.

Over the whole period (2003-2010), the majority of participations were from individuals active in institutions based in the region Hovedstaden (the region of the capital Oslo). The preliminary data on committees in 2011 seem to confirm the trend noticeable in the more recent years in that time period, ie a more frequent involvement of researchers and other stakeholders based in other Norwegian regions - in particular those based in Vestlandet, Midt Norge and Agder.

Table 7 Participations at the regional level (Norwegian stakeholders)

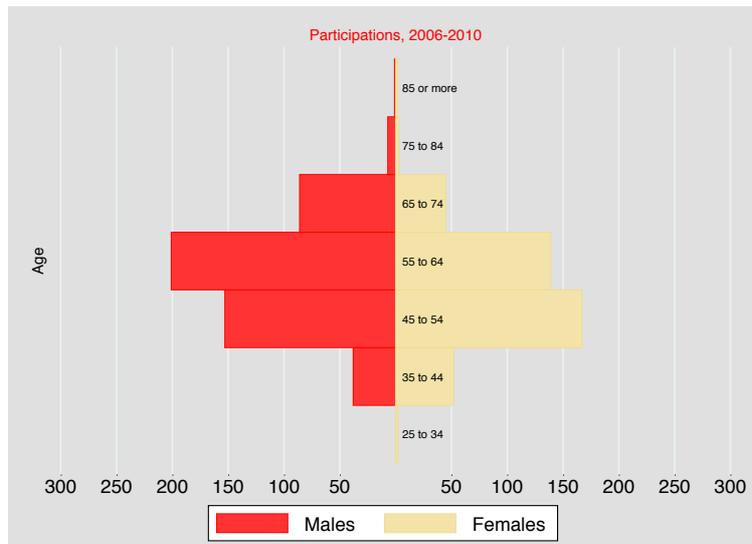
	2003-2005	2006-2010	Total (2003-2010)	2011(R)
Hovedstaden	51%	49%	50%	48%
Vestlandet	15%	15%	15%	19%
Midt-Norge	14%	15%	14%	16%
Nord Norge	10%	10%	10%	9%
Oslofjorden	3%	4%	4%	2%
Innlandet	2%	3%	3%	2%
Agder	1%	2%	1%	3%
n.a.	2%	1%	2%	1%
Total	877	663	1540	225

Source: RCN Committees database, Technopolis analysis (2012)

Last but not least, the data also show a clear trend towards a more balanced distribution among age categories and the genders. On average, committees had 44% female participants (2003-2010). We note some differences when looking into the different types of committee. Women constituted about 54% of the members of international cooperation committees and are fairly well represented also in dissemination committees and governance boards (about 49% and 46% respectively). Women were, however, underrepresented in the strategic committees.

¹⁶ Saksfremlegg HS møte 03/2009, 30. April - Sak HS 40/2009, RCN

Figure 18 Age pyramid of participations by gender (2006-2010)



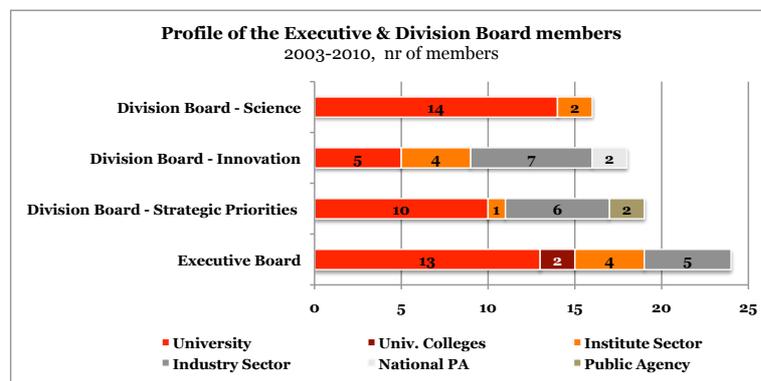
3.5.3 Profile of the Board members

In the Norwegian system, members of the Governance Boards are representatives of the stakeholder communities, selected on the base of their expertise. The Government nominates members of the Executive Board; members of the Division and Programme Boards are nominated ‘internally’ - by the body at the higher level in the hierarchy, based on the need for different kinds of expertise and an interface with key user groups.

Data for 2003-2010 on Executive and Division Boards confirm the before-mentioned limited involvement of the university colleges in the stakeholder committees. The institute sector had a fair representation in most of these boards – with the exception of the Strategic Priorities Division Board.

The profile of the participants in the Executive Boards suggest that an appropriate balance has been struck between research communities focusing on basic and more applied research.

Figure 19 Profile of the Executive & Division Boards Members



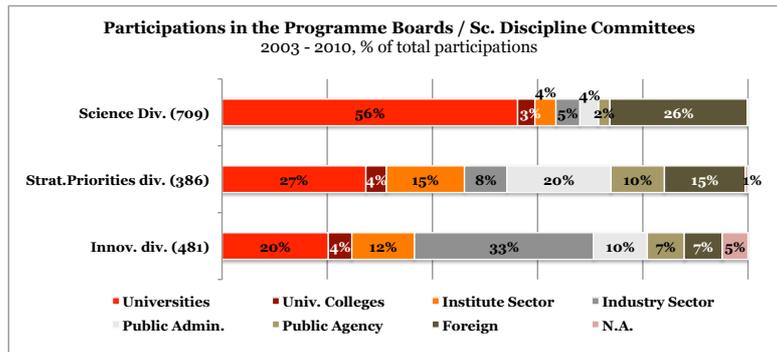
Source: RCN Committees database, Technopolis analysis (2012)

Programme Boards have a strong say in the strategic development and implementation of the research programmes. Their composition is therefore of high importance for the direction given to research activities in specific programmes

funded by RCN. The profile of the Programme Board members in the Divisions is similar to that in the other committees (see Table 6) and is characterised by a strong involvement of universities and foreign experts in the Science Division, a strong involvement of the industry sector in the Innovation Division, and a broader involvement of stakeholder communities in the Strategic Priorities Division.

University Colleges keep on being little represented and it is striking that universities have a stronger involvement in the Innovation Division and Strategic Priorities Programme Boards than the institute sector, despite the stronger positioning of the latter in the research system in relation to applied and industry-oriented research.

Figure 20 Profile of the Programme Board members in the divisions



Source: RCN Committees database, Technopolis analysis (2012)

The decision-making process for the nomination of programme board members can vary depending on the type of programme, but for action-oriented programmes, and in special cases for other programmes where the ministries are invited to participate as observers, the procedure is as follows:

- The RCN administration prepares a proposal in terms of profile of the members needed. This relates to technical and thematic expertise and/or representation of specific stakeholder groups, geographical representation. Gender equality is also a criterion. The department may consult the relevant ministries
- The RCN administration suggests to the Division Board the profile of the people to be invited to sit on the Programme Board but does not identify individual candidates. The Division Board deliberates on the proposal, eventually adding additional requests
- The RCN administration prepares a proposal for the nomination of specific individuals. The Division or Department Director consults the Ministries on the name of the Chair of the Programme Board and all relevant Ministries are requested to propose candidates (one woman and one man) for membership to the Board. Members of the Programme Board cannot simultaneously be members of a Division Board or the Executive Board
- The Division Board (or the authorised director) takes the final decision on the Programme Board's composition

Pending instructions from the Division Director, RCN may invite input from the stakeholder communities when putting together a new Programme Board and Programme Planning Committees, either through the RCN website or through other means.

3.6 Key findings

RCN's 2010 re-organisation was based on a diagnosis of internal structural issues that is considered by most to be correct. It can be expected to have positive effects on the functioning of the Division Boards and RCN's responsiveness to its tasks related to the RD&I system, such as the responsibility for the research institutes. However, it also represents a risk, ie increased complexity in coordination.

This risk appears to be accentuated by the division of the national research priorities in 2 groups for research funding management, ie ‘welfare’ priorities and ‘technology’ priorities. The ERM and SAH divisions are in charge of the former, the Division for Innovation of the latter.

The technology priorities encompass those technologies often described as ‘key enabling technologies’ for future innovation (ICT, Biotechnology and Nanotechnologies & new materials), which constitute the underlying rationale for the allocation to the Division for Innovation. However, the Large-scale programmes that focus on these technology priorities (VERDIKT, FUGE, and NANOMAT) have a strong research component – causing potential overlap with research funded in the Science Division and the responsibilities in that division for the research system. Further, several application areas for these technologies are within the ‘welfare’ priorities area (Energy & environment; Ocean; Health; and Welfare), covered by the two new divisions.

This reflection is closely linked to another topic in this study, ie the cross-divisional working groups and the profound de-centralisation of the strategic function. The operations of the cross-divisional working groups have a positive effect on the internal cohesion of RCN and its activities and respond to a need for cross-sector and cross-divisional development of the research funding strategies and priorities. Equally, the distribution of strategic intelligence throughout the RCN structure is to be considered a positive development.

Negative impacts of these working groups on the efficiency in RCN in terms of additional time and resources spent are hard to measure. Information on this topic is barely available and of dubious quality. Based on our interviews, negative effects on efficiency in terms of time spent and workload seem to be limited. Nevertheless, the sheer number of these working groups and their increasing importance in RCN’s organisational structure and operations, suggest a number of risks.

- There is tension between the thematic organisation of the Divisions and the cross-sector nature of research and the research programmes, which encourages to the development of a dual management structure
- It is not always clear in the current structure where the boundaries are between the horizontal and vertical structure in relation to higher-level strategy development, ie the role of the cross-divisional working groups versus the function of the Division Directors and in particular the Director Meetings (DM). It is unclear who has the role of ‘problem owner’ for the creation of strategic intelligence that is relevant to higher-level research policy
- The decentralised process for strategy development puts a strain on the internal capacity for coordination and seems to add complexity in the communication process to the Ministries – see Section 4.2
- The working groups are directed by officials at the highest levels, ie by members of the Director’s staff or by senior advisers/directors in the Divisions – in many cases involved in more than 1 working group. This is essential for an effective functioning of the working groups, but if the strain increases, it also risks leading to an enhanced ‘inwards’ focus of RCN in its strategy development at the higher levels, creating a loss in balance between the use of internal versus external sources for strategy development and risking that strategies becoming self-referential

The efficiency of the process for strategy development is another element of potential concern.

In the current structure, the Director’s Staff has overall responsibility for strategy development. It coordinates the various working groups that essentially took on many of the tasks that in the pre-2003 structure were in the competence of the Strategy Division, such as ensuring quality statistical indicators, identifying analysis needs, budgeting and annual reporting. The Director’s Staff provides policy advice to the Executive Board and has overall responsibility for the collection of Norwegian R&D

statistics. As such, however, the Director's Staff seems to act as an aggregator of strategic intelligence rather than creator.

Most large organisations are forced to choose some form of 'bureaucratic' organisation structure, with hierarchy ('line management') and delegation. Typically, similarities of process and the nature of the knowledge and technology needed to perform them tend to dictate how the boundaries are established between departments. Common functions and oversight may be provided by staff who sit outside the 'line' departments. Bureaucratic organisations tend to be good at doing a small number of things at large scale; they lend themselves to de-skilled rather than knowledge work; and they are often inflexible. They can benefit from using modern, small-scale organisational devices such as teams to accomplish particular tasks but these have to be organised within or across the bigger bureaucratic structure.

The normal adaptation to bureaucracy intended to tackle its weaknesses is 'matrix' organisation. For example, many large engineering companies have functionally- or skill-defined line departments plus a separate group of project managers, who assemble project-specific teams from across the functional departments in order to do a particular project. In such 'strong' matrix organisations, the matrix element has a lot of authority: the functions are there to support the projects, not the other way round.

RCN plays a role that is inherently complex. Its 16 principals form one class of 'customer' while the diverse populations of stakeholders and beneficiaries also have to be satisfied. Its responsibilities are system-wide and it has to produce not only grants but also advice and meeting places. Its three core products are hard to separate into different departments – the need largely to be co-produced. It needs to be flexible enough to change as science and its various customer groups change, so it needs a high degree of delegation within the bureaucratic structure.

The organisational philosophy at RCN today appears to be to drive the organisation as far as possible through the 'line'. The structure is a line organisation with a staff that is operated as a functional matrix. The line divisions are partly functional (science and innovation) and partly thematic (ERM and SAH). There is not a separate matrix component (so no cross-functional project managers, unlike in the engineering example). There are many compromises where the lead role on potential matrix elements has been allocated to one 'lead' division. Such cases include the ministries, internationalisation and various portfolio elements. The allocation of this lead role of often 'arbitrary' in the sense that it could have been put somewhere else. For example, the institute responsibility could probably have been put into any of the four divisions, since all have an interest in it. Its actual position reflects judgements about best fit. The horizontal groups involve a mix of strong and weak coordination, again depending on need. For example, coordination of budget discussions with ministries is inevitably strong to make sure the principals are satisfied. There are inevitably substantial coordination costs because there is no uniquely logical place to put things that affect multiple divisions. Undoubtedly, the internal organisation could be differently arranged – probably without increasing the degree of complexity – but it is not clear what the benefits would be. As it stands, there is a high degree of internal and external satisfaction with the organisation and in the absence of evidence that it is broken there seems to be no point in proposing that it should be fixed rather than monitored and if necessary tinkered with over time. In this respect the change in the statutes that allows the Director General to decide the organisation structure is a great improvement on the original statutes that effectively forbade change.

If we consider alternative foci for organisation, it is hard to identify attractive ones. (Indeed, the only suggestion we were able to obtain in the best part of 200 interviews was to organise RCN around science, innovation and societal grand challenges – like Horizon 2020. Since RCN's 2010 organisation already effectively comprises science, innovation and two 'grand challenge' divisions, we could argue that Oslo got the before Brussels.) One thinkable alternative would be to organise around the principals, with 16 strong matrix elements standing outside the line. This would increase coordination costs and increase the distance between the ministries and the parts of RCN that do

the work for them. Another would be to organise wholly around knowledge – which would involve every group having to deal with basic research as well as innovation and a wide range of stakeholders – again increasing complexity. One could break RCN up in any of a number of ways – but it is hard to see how trading external for internal coordination would reduce complexity. Organising around the different beneficiary groups would increase the fragmentation in the research and innovation system that RCN was created to combat. Organising around the national priorities would involve coping that many of RCN’s tasks are not expressed in those priorities and that such priorities change regularly. A much flatter organisation would produce huge span-of-control problems.

A business approach would be to consider cost-to-serve and stop dealing with ‘marginal’ customers such as ministries that spend smaller amounts of money through RCN or small beneficiary groups, eg the University Colleges or the North of Norway. Clearly, such an approach would be politically unacceptable. We are forced to conclude that while the 2010 organisation is inevitably imperfect, at the general level the alternatives appear to be worse. That said, key drivers of complexity are external to RCN: in particular the large number of weakly coordinated principals.

4. RCN Governance & Division of Labour

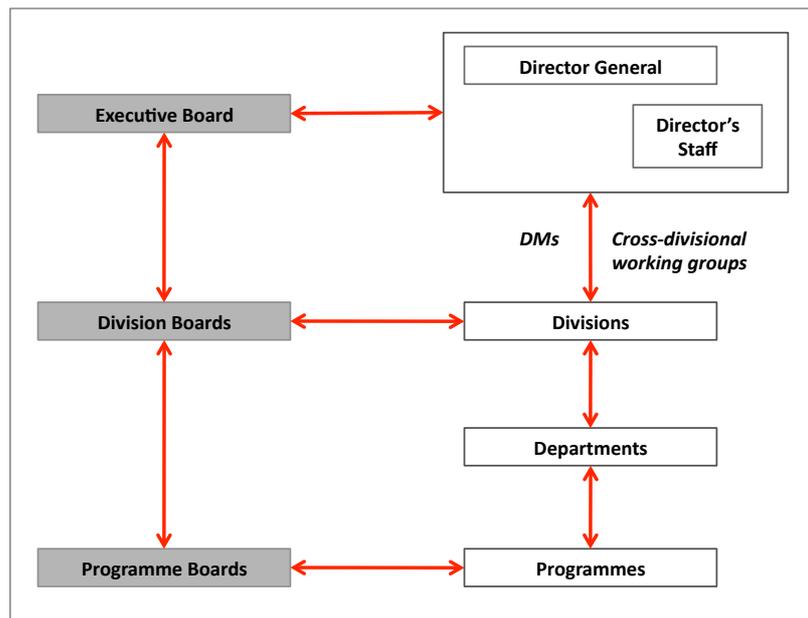
In this section, we discuss the three-level hierarchy of RCN's Governance Boards, their characteristics and functions, and the division of labour in the key management processes. We conclude by setting our main findings in the context of international practice.

4.1 Characteristics and functions of the Governance bodies

4.1.1 Governance Structure

Three levels of boards (or committees) govern RCN, mirroring the administrative hierarchical structure (Figure 21).

Figure 21 The three-level hierarchy in the governance structure



The Executive Board is responsible for the overall activities of the Research Council, including the implementation of the research policy guidelines drawn up by the Government and the Parliament and drawing up the Research Council's strategy. It is also an advisory body and provides input to the government on (future) research policy. The Executive Board represents the Research Council in the dialogue on institutional governance with the Ministry of Education and Research. It is made up of seven permanent members and two deputies, appointed by the Government; it in turn appoints the Director General of RCN and the members of the Division Boards. Nomination is for four years and the Board meets seven or eight times per year.

The Division Boards¹⁷ carry out activities within the framework and guidelines issued by the Executive Board. They report and provide strategic advice to the Executive Board, have primary responsibility for the Divisions' performance, and steer the Divisions' implementation of RCN and government strategies. They tend to meet around six or eight times per year and have 9 to 10 members. Currently, the Chairs of the Division Boards are also members of the Executive Board.

¹⁷ Also called Research Boards

Programme Boards, in the Science Division including the Scientific Discipline Committees, receive their mandates from the Divisional Boards and have specific responsibility for the selection and monitoring of R&D projects. The Programme Boards are also to ensure that the programme targets are met in the most efficient manner, in line with the plans submitted and within the limits approved by the Division Board, and have a strong role in setting priorities within the programmes. Programme Boards normally have 7 members and 2 deputy members.

4.1.2 Functions and Activities

The major mandate of the governance boards is to ensure the accountability of the Council. They have three major types of function, i.e. an advisory function [rådgivning], a decision-making function [styring], and a quality assurance function [kontroll].

Table 8 summarises the remits of the boards at the different levels in RCN against these functions, based on the mandates and completed with a scrutiny of the Executive Board meeting minutes and the minutes of the Division Boards for 2009 and 2010.¹⁸

Table 8 Functions of the Governance Boards

Board	Advisory function	Decision-making function	Quality assurance function
Executive Board	<ul style="list-style-type: none"> • Input to <i>government & ministries</i> on (future) policies • Input to RCN administration on high-level policy and organisational issues 	<ul style="list-style-type: none"> • RCN strategy • Budget proposals • Budget allocations among divisions & guidelines • Nomination of the Director General and the Division Board members • Project funding for flagship initiatives 	<ul style="list-style-type: none"> • Implementation of research policy guidelines • Performance and functioning of RCN • RCN internal division of labour & cohesiveness
Division Boards	<ul style="list-style-type: none"> • Input to <i>government & ministries</i> on specific research policies • Input to <i>Executive Board</i> on RCN strategic priorities and funding proposals • Input to RCN administration on programme portfolio and follow-up of evaluations 	<ul style="list-style-type: none"> • The Division programme portfolio • Approval of programme plans • Nomination of Programme planning committees and Programme Boards 	<ul style="list-style-type: none"> • Performance of the Divisions • Programme development and implementation • Evaluations and follow-up actions
Programme Boards	<ul style="list-style-type: none"> • Input to <i>Division Boards</i> on key developments in field of responsibility • Input to RCN administration on programme strategy and (action) plans, research strategy documents, funds for communication and dissemination, programme follow-up 	<ul style="list-style-type: none"> • Programme strategy (programme plans/ action plans) • Project funding • Approval of final project reports 	<ul style="list-style-type: none"> • Implementation of the funding processes • Monitoring of programme performance in meeting the targets

From this overview and the more detailed description below there appears to be a clear and straightforward division of labour between the board levels – reflected in each of the functions – with no apparent duplication of activities in the *current* remits.

¹⁸ See the Appendix to this report (separate report)

The ‘subsidiarity’ principle is adopted appropriately, ie decisions are taken at as low a level in the hierarchy as possible. The only exception is the role of the Executive Board as final decision-maker for project funding in a few of the RCN flagship initiatives, taking up the role that normally be given to the Programme Boards. In these cases, the authority of the Executive Board was deemed necessary for decision-making, in particular to avoid claims of conflicts of interest.

In relation to the flow of information, we distinguish between two dimensions: the ‘vertical’ dimension, ie the communication between the different board levels, and the ‘horizontal’ one, ie between the boards and the Government/Ministries on the one hand and the RCN administration on the other.

The ‘vertical’ flow of information is achieved through a clear hierarchical reporting system and has been recently been enhanced by making the Division Board Chairs full members of the Executive Board. The latter constitutes an important change in practice. In RCN’s early years there was no formal linkage between levels; in later years the Division Board Chairs were allowed to participate in Executive Board meetings as observers.

Interviewees pointed to some difficulties for the Division Board Chairs in managing their dual positions as members of the Division Boards as well as members of the Executive Board. They felt this would it difficult for them to avoid acting as representatives of the Divisions rather than acting as members of a unified Executive Board. Division Board chairs disagreed.

In relation to the ‘horizontal’ flow of information, the meeting minutes and annual reports of the Executive Board indicate a regular communication with *ministries* in the Executive and Division Boards, and occasionally for the Executive Board also with the Government. However, there was no track of any dialogue with the Government Research Committee, the RFU.

There was also a close and regular dialogue with the *RCN Administration* at all levels of the hierarchy, with input and comments going in both directions.

Each Board meeting makes use of supportive literature and background research, sometimes compiled specifically for the Board and this is, if not prepared by an external contractor or ministry, organised and compiled by the RCN Administration. This generates a significant workload for the RCN Administration and at times resulted in an information overload for the board members at Division and Executive levels.

The sheer amount of topics to handle and information to digest, in a relatively short time, led to the impression among many people that the boards’ role was reduced to a rubber-stamping of decisions proposed by the RCN administration. The minutes of the Division Boards for 2009 and 2010 contradict this view, at least to a certain extent. Particularly in matters related to research in the specific fields, such as evaluations and the follow-up activities, board members provided recommendations to the RCN administration on certain aspects that needed further investigation or on actions to be implemented. Interviewees considered that the RCN administration was in general also very receptive to these recommendations and took them into account.

In relation to the decision-making function, the major issue that emerges from our analysis of the relevant documents and interviews, is the lack of space for the Boards to make decisions involving radical changes in direction – in particular at the level of Division and Programme Boards, due to the lack of flexibility in the funding system. We cover this point further in Section 4.2.2 when describing the Boards’ role in the budgeting process.

4.1.3 Description of the boards’ main activities

The activities of the **Executive Board** are centred on high-level policy and organisational matters. It works on activities relating to the broader, national research policy – on issues particularly pertinent to Norway, such as researcher recruitment,

and impacts on Norway resulting from the development of the European Research Area.

The board minutes reveal a focus on activities that could be said to be dealing with general organisational steering, both within RCN as well as via ministry coordination, such as budget discussions, strategy developments, and matters around Management by Objectives and the sector principle.

The Executive Board also has responsibility for ensuring that the Research Council operates efficiently and as an integrated body. This involves among other things delegating tasks and allocating funding responsibilities within the Research Council, assessing RCN's internal organisation and division of labour, monitoring the functioning of the Division Boards, and ensuring adequate cooperation within the Research Council itself.

The Executive Board is also the final decision-maker for project funding in a few of the RCN flagship initiatives, taking up the role that is normally given to the Programme Boards. This relates to the three Centres schemes and the Research Infrastructure programme, representing RCN's major direct systemic interventions.

During 2010, the work of the Executive Board encompassed follow-up work relating to the RCN strategy (published in 2009) and the reorganisation of the Division Boards, as well as overseeing flagship RCN programmes and national research policy matters.

At the second level, the **Division Boards** have an overall strategic responsibility for the establishment, steering, and monitoring of the Division's programme portfolio. They nominate the members of the Programme planning committees and the Programme Boards and quality assure the processes for programme development and implementation. Decisions about funding individual projects are delegated to the third level, ie the Programme Boards.

Broadly speaking the agenda items discussed at any of the Division Board meetings focused on the following three areas

- *Programme Management*, including evaluations and programme analysis
- *Research Policy*, encompassing discipline or thematic strategy development and national research policy matters
- *Budgets*, including developing themes/disciplines and defining programme priorities

There are some specificities to each Division Board, which grow out of the specific thematic remits of the Divisions

- The *Division for Science Board* meetings focus on programme development, operations, and evaluations within the science portfolio. Other prominent discussions involve the Board's overseeing of the research institutes, and participation in Nordic and European science collaborations. The board also nominates the members of the Scientific Committees handling the proposal appraisals for the response-mode funding
- As with the Division Board for Science a large part of the *Innovation Division's* work is programme steering, including evaluation, specific programme analysis, programme portfolio analyses, budget proposal/allocation discussions, and research and innovation policy and strategy input to the Executive Board and to ministries.
- During its time, the *Division for Strategic Priorities* was responsible for "analysing the challenges facing society and following up areas of research of national importance"²⁰. Discussions in this Division Board, centred on the Large-scale programmes, focused on ensuring that the programme portfolio and priorities would respond to these challenges and reflect the national priorities. The

²⁰ *About the Research Council of Norway*, Publication from 2007

broad responsibility of this Board was visible also in the more comprehensive list of updates on policy and research events.

In addition, the Division Boards on occasion also undertake specific tasks, e.g. to develop the Nordic White Paper on Medical Research.

Programme Boards are responsible for their programme strategy, including the development of the programme plans, which are to be approved by the Division Board. They further develop the programme within the framework approved, decide on the priority areas for the research (thematic areas and instruments), follow-up evaluations in the relevant fields and the signals from the administration on research policy and other strategically relevant matters, and decide on the action plans (and communication plans). In relation to communication on the programme, the Programme Board is expected to contribute to the communication with applicants and the public

Input by the RCN administration

Our scrutiny of the minutes of the Division Boards' meetings showed that the administration provided a considerable amount of information to the board members in preparation of the meetings.

A simple count of the documents referred to in the minutes as a case document show at times a hefty reading list for the Division Board members. In particular for the Boards of the Science and Strategic Priorities, Divisions who may be asked to look into more than 15 individual documents in preparation (although the average reading list may be estimated to lie between 5-10 documents, which is still a substantial amount of work)..

The reading lists tend to include

- Outlines, summaries and proposals of programme and RCN budgets
- Evaluation reports
- Letters or memos sent within or to/from RCN
- Briefing notes on specific issues
- Grant proposals

4.1.4 The view of the Board members

We took care to interview a large number of present and past members of all three steering levels. Most felt that the degree to which any of the Boards influenced strategy was limited not only by the time they could devote to sitting on the board and by the close dialogue between RCN and the ministries that appeared to leave little space for manoeuvre. At the level of the Division and Executive Boards, many felt their role was largely rubber-stamping though a number argued that the role of such Boards is to a high degree oversight and that they to some degree perform their function by existing, checking and approving rather than taking much initiative. There were few complaints that individuals acted as representatives of their organisations or sectors rather than sitting in a personal expert capacity. There was universal agreement that the administration prepares and manages the meetings well, even if the volume of required reading could be too high to manage.

No-one was in doubt that the Executive Board was needed, to give RCN legitimacy, to provide oversight and to personify the advice it provides. It could have a greater role in overall strategy but that would require more strategic intelligence.

The role of the Programme Boards was equally seen as self-evident. There were a number of complaints about the new, stronger conflict of interest rules that were appropriate in science funding but that were less so in mission and innovation funding where stakeholder interests need to play a part in decision making. A minority of institute directors even argued that they now avoid the Programme Boards as being present makes it harder, not easier, to get funding.

The Division Boards' role has been less clear in the past. Given the limited degree to which they could really decide things, many felt that they existed primarily in order to manage the huge span of control there would otherwise be between the Executive and Programme levels. The Science Division's Board plays a strong role in establishing RCN's legitimacy in the eyes of the scientific community. The two new Division Boards were seen as an improvement over their single predecessor because they made it possible to apply professional and disciplinary knowledge in a way that was hard to do when the Strategic Priorities Division had no thematic focus. It is now possible to strengthen the role of the Division Boards in advising RCN and developing strategies in a way that would have been harder under the 2003-2010 organisation.

4.2 Division of Labour in Key Management Processes

4.2.1 Programme design

The process established for the design of the programmes is characterised by an initial strong influence and decision-making power for the Division Boards, gradually given over to the Programme Boards when the programme reaches its more operational phase.

The formal programme design phase starts with the Division Boards calling for the implementation of a programme by requesting a programme planning committee. The Boards request needs to include (as a minimum) i) the disciplinary/thematic focus of the programme, ii) a timeframe and total budget, along with various budget scenarios for the programme, iii) a timeframe for the implementation of the programme.

During the decision-making it is also the Division Boards' responsibility to

- Establish goals and thematic and economic frameworks for the programme
- Quality assess input from the Administration on political and other relevant strategic information and possible consequences for the Division programme portfolio

Once the programme development phase is concluded – described more in detail below - and the Programme Board is in place, the Division Board passes over its decision-making function to the Programme Board (by delegating the authority for funding to the Programme Boards) and predominantly assumes a quality-assurance function. It is in charge of monitoring the division's programme portfolio in terms of budget and results or objectives, i.e. the programme and actions plans (and reports annually on the programme to the Executive Board) and maintains regular contacts with the Programme Boards.

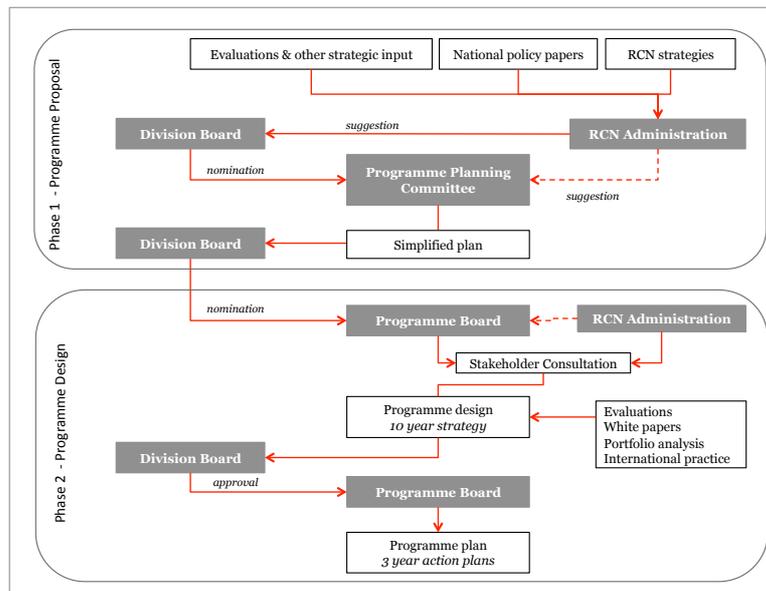
The Division Board reassumes its decision-making function only in exceptional cases and at the end of the programme: it has the right to change the composition of the Programme Board during the course of the programme and it intervenes if the Programme Boards exceed or fail to obey their mandate and/or the technical and financial framework of the programme. Finally, it approves the Programme Board's final report.

The RCN Administration normally takes the initiative to design new programmes. Its role further in the process is to support the Division and Programme Boards by providing needed background information and strategic intelligence, including the description of the needed job profiles and potential names of Programme Board members, and the project portfolio and gap analyses for decision-making on the annual action plans.

Figure 22 maps out the process adopted in RCN for the development of new programmes. This description is based on the relevant RCN Guidelines.²¹

²¹ C-1-1 Retningslinjer for programsatsinger, RCN, 2012

Figure 22 Programme development process



The Guidelines say that the process for the development of a new programme usually starts as part of preparations for the Research Council's annual budget.

New programme initiatives are announced in the Research Council's draft budget for the coming fiscal year (in March of year x-1). The RCN administration nominates a Programme Coordinator and the Division Board appoints a Programme Planning Committee (*programplanutvalg*) to develop a simplified programme plan within the proposed budget presented in the autumn of that year (year x-1). This plan should include a proposed text for a limited first call for proposals. If the government budget gives a positive response, a limited (financial and thematic) call for proposals is published with a deadline early in the following year (usually February).

In parallel with the publication of the first call, the process for the development of a complete programme plan starts with the appointment of a Programme Board (see Section 3.5.3). The Programme Board works with a mandate that is approved by the Division Board. It can take responsibility for the planning process as well as for processing the applications and monitoring the initial limited call.

The Programme Board is responsible for the development of the programme plan and in particular the formulation and specification of the objectives, the description of key issues and needs for R&D, drafting the budget, setting milestones and drafting a communication plan.

Programme plans are developed in two phases. At each stage, approval is required from the Division Board. In the first phase the Programme Board defines the long-term, 10-year strategy; upon approval, it develops the 3-year programme plan. A preliminary version of the complete programme schedule should be available in time to be included into the draft budget for the coming year (in March). A final version should preferably be approved by the Division Board before the summer and is included in the final budget for the coming year.

Subsequently, the Programme Board has core responsibility for decision-making on the annual action plans (within the framework of the approved programme plans). These action plans guide the calls and are developed based on a portfolio and gap analysis.

4.2.2 The budget proposal design process

The budgeting process is one of the key management processes in RCN and illustrates the interplay between the cross-divisional working groups (the internal 'horizontal' management structure), the Divisions (the 'vertical' management structure), and the Boards.

The process involves two major phases: a preparatory phase where the underlying principles are defined and resulting in a proposal at the level of strategic priorities, and a finalisation phase during which the detailed budget proposal is developed. The entire process takes approximately 3/4 year.

Figure 23 summarises the process, based upon the RCN internal Guidelines.²² The diagram illustrates the important role of the cross-divisional Budget Forum, chaired by the Director's staff. The Budget Forum co-ordinates the input from the cross-working groups and senior experts in the Divisions, acts as facilitator for the discussions in the Directors' Meeting, and takes into consideration the feedback received from the Executive Board and the Division Boards for the development of the different versions of the budget proposal, in all phases of the process. There is opportunity for dialogues among the different Board levels; the Executive Board is responsible for quality assurance and the internal approval of the budget proposals.

In the preparatory phase, the different dimensions in the priorities that guide the budget proposal are defined and agreed upon in different steps: first the main priorities; then the other priorities; and finally the application of these priorities to the proposals to the different Ministries.

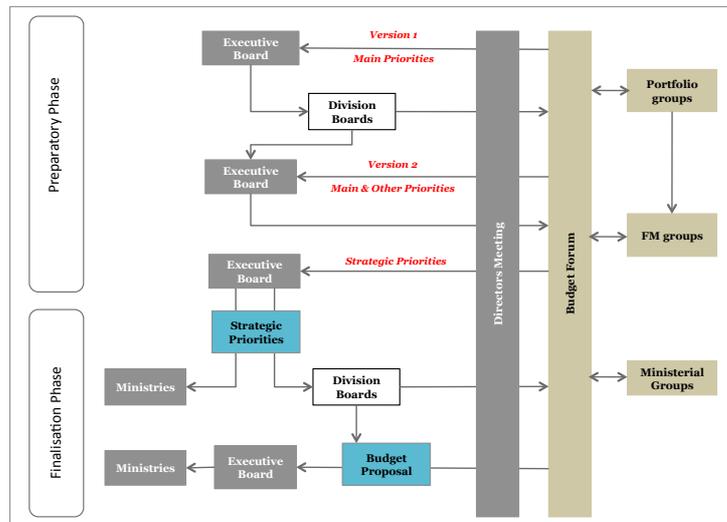
In the first step, the administration proposes an internal draft of the budget proposal - Version 1, covering only the 'main priorities'. These priorities follow up the strategic objectives that are defined in the White Papers and the Research Council's strategy and action plan.

This version builds upon the input from the Ministry groups, the Directors' meeting and the cross-divisional FM-groups, which in turn have received input on the existing RCN portfolio from the cross-divisional PG-groups (see also Section 3.3). The Executive Board takes a preliminary decision in relation to the main priorities for the annual budget. The draft is then forwarded to the Division Boards for comments and alternative proposals.

Version 2 of the internal draft reports and discusses the Division Boards' input and based upon consultation with the Directors and the FM-groups, includes also a draft budget for the other priorities so that the Executive Board has a view on the proposed overall budget framework. The Executive Board discusses and approves the final framework for all priorities, without establishing the sub-division of the budgets among the Ministries..

²² Rådgiveren – styrende dokumenter, B-2-01 v2 Budsjettforslag, RCN, 2010

Figure 23 Process for the drafting of annual budget proposals



Source: RCN guidelines

The next step merges the internal draft Version 2 with the budget needs for specific programmes and instruments, setting it in the context of the overall Government funding framework (per Ministry) and taking into account the alignment of the proposals with the other key research dimensions. If necessary, the Ministry groups provide input and clarifications.

The proposal at the level of ‘Strategic Priorities’ entails a proposal for contribution to the main and other priorities’ budgets for each single Ministry, taking into account the state budget and the Ministry shares of the previous year. The Division with key responsibility for a Ministry drafts the section of the proposal related to that Ministry. It should account for RCN’s main priorities, but the analysis should be at a sufficiently detailed level for the Ministries to use it in their preparatory work for the state budget.

On approval of this proposal by the Executive Board, the Budget Forum co-ordinates the drafting of the final budget proposal, which includes all programmes and activities, detailed at the level of each Ministry.

5. The Funding Process

This Section reports on the quality of RCN’s funding processes and their alignment with international practice. We first set the analysis against the background of the research communities’ assessment and give an overview of funding modes and selection criteria. Subsequently we provide a description of the funding procedures – overall and in a set of specific support measures, and look into two important quality measures for funding processes: success rates and score distributions. Finally we summarise our main findings, setting them in the context of international practice.

5.1 Introduction

Internationally applied quality evaluation criteria for proposal appraising processes typically address the general principles of rigour, transparency, objectivity and fairness, and efficiency.

This includes topics such as the rigour in the implementation of the procedures, including the use of the agreed selection criteria; transparency in terms of the access to relevant information, the clarity and understanding of relevant documents, the funding decisions, and the information on the outcomes of the appraisal; efficiency related to time-to-contract; and the administrative obligations in the application, reporting and payment processes.

Table 9 Programmes and appraisal practices considered in this chapter

Intervention category	Name
Programmes	
Large-scale programme	RENERGI; VERDIKT
Policy-oriented programme	HAVKYST
Response-mode funding	
Bottom-up basic research	FRIPRO
Bottom-up research for innovation	BIA*
Centres programme	
Centres for Research	SFF
Competence Centres	SFI

Notes: *In the RCN categorisation, BIA belongs to the category of User-directed Innovation programmes. The BIA programme funds bottom-up innovation-oriented research, without thematic steering of the proposals or projects

In the paragraphs below we first set the background, reporting on the assessment of the funding process provided by the applicants themselves and giving an overview of RCN’s funding modes and selection criteria.

5.1.1 Assessment by the research communities

In the survey conducted in the context of this study, we asked the research stakeholders to provide an assessment of their level of satisfaction with the proposal appraisal procedures.

In general the quality and leanness of the RCN funding processes was considered to be in line with international good practice; RCN was also considered to ensure gender equality in research funding. Progress was made since the beginning of the 2000s – in particular in relation to the quality of the feedback to the applicants and the efficiency of the process in terms of its duration. Access to relevant background information was considered satisfactory, as was the clarity of the information provided during the calls. The distinction between the different proposal types does not constitute an issue.

Survey respondents were less positive about the fairness and transparency of funding decisions and about the cost effectiveness of the application process. Free-text comments backed up the message from many interviews that applicants in many cases feel funding decision have a politicised dimension and that ‘insiders’ in key social networks have better chances of being funded than others. Low success rates drove the

perception of low cost effectiveness with many respondents and interviewees pointing particularly to the low success rates of FRIPRO. A major frustration emerging was that it has become increasingly difficult to win funds based on a good scientific application only. Industry applicants in particular pleaded for two-step application processes.

There was some criticism of the level of detail in the description of the topics to be covered. A respondent considered that these descriptions, based on “detailed strategic processes going into way too much detail when it comes to the research topics” entail the risk that research is outdated by the time it is concluded.

5.1.2 Funding modes and selection criteria

RCN has a number of specific schemes for its competitive research funding, in many cases and increasingly focusing on funding a mix of basic and applied research and targeting different stakeholder groups. Each funding instrument (‘proposal types’) has a defined assessment process. A major distinction is made between Research and Innovation, guiding the processes adopted in the review panels as well as the selection criteria used.

Selection criteria are defined at the level of *single* proposal types, but can be summarised as shown in Table 10. Research proposals tend to be assessed using all or many of the criteria listed below; for innovation-focused applications involving industry the list of criteria tends to be somewhat longer.

Table 10 Main selection criteria for the proposal categories

Research proposals	Innovation-focused applications
Relevance relative to the call for proposals	
International cooperation	
Scientific merit	Level of research
The project manager and project group	R&D-related risk
National cooperation	Level of innovation
Feasibility	Potential for value creation for industrial partners
Dissemination and communication of results	Realisation of the innovation
	R&D project quality
	Implementation capacity
	Relevance of the research for innovation
	Other socio-economic benefits
	Additionality
	Quality of the application documents

The selection criteria communicated in the calls are normally the ones listed for these two proposal categories, with reference to the proposal type descriptions for more precise information. In addition, RCN may specify additional assessment criteria in individual calls for proposals, and this caveat is generally published.

The Research Council lists 20 different instruments (proposal types) through which to apply for funding.²³ Seven of these are designed for individual researchers. Table 11 lists the 12 most commonly used application types in the period 2003-2010. For each type of application, RCN specifies the objectives, specific selection criteria, the expenses that may be covered, eligible types of applicants, project description requirements, and the type of documents to provide (including size indications).

²³ The list and description of these proposal types are provided in the annex to this report

Table 11 Main funding instruments, 2003-2010

Individual projects	R&D projects
Individual mobility grant	Research project
Post-doc grant	User-directed innovation project
Doctorate grant	Competence development with user involvement
Grant for abroad	Project development support
Guest-researcher grant	Institutional strategic project
Student grant	Pre-project

The RCN website makes clear that the assessment panels also take into account overall criteria which encompass Ethical perspectives, Environmental impact, Recruitment of women, Gender balance in the project, Gender perspectives in the research, and Internationalisation (although the latter may also be specified in the actual proposal type).

Neither the RCN web pages describing the proposal types nor the calls for proposals specify how the organisation, assessment panel, or programme board weighs the list of criteria to make the final funding decision. The exceptions we have seen give a general indication of themes preferred or ‘greater weight’ that will be given to certain selection criteria, without giving more detail.

5.2 Description of the funding processes

5.2.1 Background

RCN has issued a broad set of guidelines (*Rådviseren*²⁴) listing the standard procedures for the processing of the applications. This includes the definition of the proposal types that guide eligibility and selection criteria, standardisation of the application appraisal and selection procedures at the level of instrument types, the division of labour between programme boards and administration, and last but not least, the conflict of interest rules. These documents are regularly updated, tracking the standard procedures that were changed compared to the original guidelines.

Drafting and updating these guidelines is the task of the cross-divisional R&D Committee working group (see section 3.3). This working group also decides the annual dates for the calls of proposal; the programme coordinators and their team then decide which date to use for their call(s).

The Programme Coordinator, together with the programme staff, is responsible for the call announcement and the application appraisal and selection processes. Specific tasks include ensuring *rigour in the funding process*, ie the follow up of the standard procedures and the assessment of the proposals in line with the guidelines and rules that apply to the various proposal types.

The entire application submission and management process has also been thoroughly digitalised through a set of electronic application and project management systems. Applications are to be submitted electronically via the web application form eSøknad. Calls and applications are registered in the eAdmin/Foriss system and application documentation is stored electronically in the DocuLive system, providing the

²⁴ Relevant documents include the Application processing and assessment guideline (C-1-04 Søknadstyper og vurderingskriterier) describing the currently applicable application types and associated assessment criteria; the guidelines describing the procedures to be adopted for the calls (C-1-03 Forberedelse til og håndtering av søknadsfrister), covering both the one-step and two-step application processes, and the guidelines for the preparation and management of application deadlines (C-1-03 Forberedelse til og håndtering av søknadsfrister) describing the procedures to be followed in the interaction with the IT department. An overview of the main procedures is provided in a Proposal Management guidelines (C-1-05 Søknadsbehandling). Last but not least, there are the conflict of interest rules (A-0-09 Guidelines on Impartiality and Confidence).

programme managers with a user-friendly interface for the review and retrieval of an application. Since the beginning of 2011, RCN also has the e-Assessment portal in place, allowing for a remote handling of the proposals ('virtual' review panels).

There is no system in place to track the application history of a specific researcher over time. Monitoring of success rates and score distributions over time seems to depend on the individual practice of programme coordinators rather than established common practice.

5.2.2 Description of the standardised procedures

Publication of the call for proposals

The guidelines for the procedures set stringent deadlines for the publication of the calls of proposals, i.e. a minimum of six weeks and preferably 10 weeks' notice. In our survey, applicants from industry noted that this was too short a deadline taking into account the needs of the sector. More generally, industry and its representatives argued that annual calls are inappropriate for innovation projects. Ideally there should be a continuously open call. Failing that, there should be several calls per year.

Particular attention is paid to the quality and breadth of the information provided to the potential applicants. The call and the information relevant to the proposals is to be published centrally on the RCN website as well as linked from the programme web pages. The calls for proposals are expected to include information on what type of applications will be accepted, what themes (if applicable) are open for proposals, the name and contact details of the contact person from the relevant division, eligibility requirements, and the criteria that are relevant for the proposal assessment (see Section 5.1.2). Guidelines for writing proposals are also provided, including the requirements regarding the content and size of the documents to attach.

The information should also include the approximate budget for the actual call. Normally, this does not include specification of an envisaged allocation between the different proposal types if more than one is admitted or thematic/topic areas – if applicable.

The programme documentation describes the overall research area, priority thematic areas, and objectives relevant to the programme, for example basic and applied research, interaction and cross-disciplinarity, relevance and benefit to users, international perspectives and internationalisation of research. The programme documentation also gives applicants an idea of overall budget scenarios and priorities for the full programme period and lists other programmes with similar focus areas.

Proposal submission

In general, RCN applies a one-step application process. A two-step process, where initial applications are followed by an invitation to submit a full proposal, is currently used in the Research Infrastructures programme and for the Centres programmes (SFF, SFI, FME).

Proposals can be submitted simultaneously for more than one programme. Once proposals are received, the applicant and the primary institution are notified and receive an official confirmation of receipt, including the project number and the name of the case officer assigned.

As a measure to ensure fairness, applicants may *suggest referees* to review their application and can also *raise an objection* if there are reasons that a particular individual should not serve as a referee for the proposal. RCN is however not obliged to act on either of these points.

The language in which the proposal can be submitted is indicated in the call; in the case that non-Nordic experts are intended to be part of the review panels, the proposal must be submitted in English.

Appraisal against eligibility criteria

The RCN Programme Staff is responsible for checking that the application (including attachments) meets the requirements that were indicated in the call announcement. Applications that do not meet the requirements are rejected on formal grounds. Objectivity is guaranteed by a requirement for assessment by at least two employees within the programme staff or department. The recommendation of the guidelines is that this appraisal should preferably be concluded within one month of the deadline.

The rules include a degree of flexibility. If the conclusions of the appraisal are that the application is more relevant for another programme, RCN rules foresee the possibility that an application be transferred to another programme with the same deadline. Such transfer can be done only with the permission of the applicant and should preferably happen within three weeks after the deadline. If an applicant requests that the application is moved from one programme to another, this can only be done if RCN believes there is legitimate scientific justification. In this case, it is the Research Council that decides.

General proposal appraisal rules

The current guidelines set *stringent limits* also to the processing time for applications, defined for the programmes at a maximum of 12 weeks (i.e. 60 working days).²⁵

Assessments can either be made by a panel of experts or by individual expert reviewers (a minimum of two, and three in case of diverging assessments by the first two). A key measure to ensure objectivity, transparency and consistency in the appraisal of the proposals, highly appreciated by stakeholders and RCN personnel, was the recent adoption – in most programmes - of an ERC²⁶-style panel system rather than the previously implemented reporting one.

Referees are asked to assess sufficient applications to enable them to judge proposals' quality relative to others' and are also obliged to comply with the Research Council's 'impartiality and confidence' rules (conflict of interest).

Numeric scores (scale 1-7) are used for the assessment of the scientific criteria (scientific merit and the applicant/research group); letter scores (A/C) are used for the other selection criteria.

Table 12 RCN proposal assessment scales

Scale A-C	Scale 1-7
A Very good	7 Exceptional
B Good	6 Excellent
C Weak	5 Very good
	4 Good
	3 Fair
	2 Weak
	1 Poor

The guidelines²⁷ indicate some general rules for the **review panels' evaluations**, making a distinction between innovation-oriented and research-driven projects.

- The rules for innovation-oriented projects revolve around issues of fairness and objectivity, rigour, and confidentiality.
 - The rules establish that at least 3 panel members should evaluate each application and consider the specific criteria for each individual project, without making a ranking. The panel should reach consensus in its assessment

²⁵ RCN C-1-05 Søknadsbehandling, 2011

²⁶ European Research Council

²⁷ RCN C-1-05 Søknadsbehandling, 2011

- and communicate the results to the programme administration in the form of a grade for each criterion.
 - Rigour in the implementation of the rules is guaranteed by compilation of a protocol for each proposal, which is then filed.
 - Potential confidentiality issues are taken care of by the rules that no application documents are distributed to the panel and all reading and assessments are made on site. When the panel has completed its work, all application documents and any notes are given to the RCN administration for destruction.
- Rules for the research-driven projects differ from the ones for the innovation-oriented projects in their greater attention to fairness, objectivity and rigour. Some details such as the ranking of the proposals by the review panels and the request for the review panel to reach consensus are left open. Confidentiality is not an issue here.
 - The relevant experts are grouped in field-based panels. Each panel is assigned a certain number of applications. All applications are to be read and reviewed by all panel members. The panel may appoint a reporter for each application, who should then lead the panel discussion on the proposal and prepare a draft for a written assessment, or just give the number grade, which should be communicated to the other panel members before the meeting. The panel may reach a common assessment of the applications either in communication by e-mail, by telephone or gathered in a meeting and may be asked to rank the applications. The administration decides who will head the panel meetings (a panel member or an RCN employee)
 - The panel is expected to draw up an agreed written assessment of each application. It should state if it was absolutely impossible to reach consensus on the assessment of an application or if the panel will provide several reviews of an application. In such cases, the administration will consider whether to obtain further evaluations of the application. The conclusions of the panel should be documented in the form of a completed evaluation form for each application and eventually minutes of the panel meeting and/or a table listing the applications in ranked order.

The programme boards, scientific discipline committees (in the case of response-mode funding for basic research), or the Executive Board (in the case of the Competence Centres and the Research Infrastructures programme) take the final formal decision.

Post-assessment information

There is full transparency on how funding decisions are made. Applicants receive the expert assessments along with the scores obtained, the criteria used and where (on the RCN website) to find the details of the experts involved in the assessment - without putting in a request.

In addition, applicants may request the name of the experts involved in the assessment of his/her proposal. National law stipulates that expert assessments are not exempt from freedom of information legislation. Indeed, any interested party can request to view the assessment; however, RCN is also obliged to omit any information subject to secrecy, and may also omit all specific information relating to research ideas and the research project itself.

Rejected applicants can complain to the administration if they believe there has been a procedural error or abuse of authority.

5.2.3 Response-mode funding of basic research - FRIPRO

Description of the scheme

The RCN funding scheme for bottom-up basic research is known as FRIPRO. This scheme provides funding for independent research projects. Applications are normally submitted in closed calls; scientific merit is the central criterion, but other criteria

such as relevance are also taken into consideration. The 2012 FRIPRO budget is NOK620m.

Proposal types that are funded under this scheme are researcher projects, postdoctoral fellowships, doctoral fellowships abroad, and events. Currently, priority is given to researcher projects and postdoctoral fellowships. Applications are open for universities and university colleges, independent research institutes, and other publicly funded research groups.

Time from application to decision is 25 weeks - compared to 48 weeks in the ERC.

Administrative set-up

As of 2011, the FRIPRO scheme makes use of 4 scientific committees, nominated by the Division Board of the Division of Science and structured around 4 scientific fields, each covering various scientific disciplines:

- Medicine, Health and Biology (FRIMEDBIO) – 10 members: 5 Norwegians, 3 from Sweden and 2 from Denmark
- Mathematics, Physical Science (FRINATEK) – 7 members: 5 from Norway and 1 from Sweden and Denmark respectively
- Humanities (FRIHUM) – 10 members: 7 national experts, 2 from Denmark and 1 from Sweden
- Social Science (FRISAM) – 10 members: 7 national experts, 2 from Denmark and 1 from Sweden

The number of scientific committees was gradually reduced over the years (there were 9 committees in 2004-2007, 7 committees in 2007-2010). This essentially broadened the areas of responsibility for the scientific committee members but contemporaneously may facilitate the handling of interdisciplinary applications.

The peer review panels relate to specific disciplines and are made up of 5-7 members. They are ad hoc, ie nominated for each call and reflecting the disciplines covered in the grant applications. There may be multiple panels for a discipline, depending on the number of applications. There are currently a total of 37 panels, involving around 200 experts.

Members of the review panels are *nominated by the RCN administration*. The RCN administration, the applicants, and members of earlier panels propose potential candidates; another source is a database of experts that is used throughout the Council. The RCN administration checks the credentials of potential panellists and asks them about conflict of interest.

In order to reduce the risk of conflict of interests or disqualification among panel members, all reviewers are foreigners; Norwegian referees are only used in exceptional cases. The panel members are requested to follow RCN's regulations on impartiality and confidence, which also address conflict of interest.

Budget allocations

As the only Ministry funding FRIPRO, the Ministry of Education and Research sets the overall budget for the programme. Budgets at the level of the 4 scientific fields – so at the disposal of the Scientific Committees - are pre-allocated by the Science Division Board. This decision is based on historical allocations for scientific fields. RCN has proposed to move to a budget allocation system based on the total amount research activity in each field in the universities at the national level, which it takes as an indicator of size and need. For the time being, additions to the budget are being allocated using this key but the baseline is the previous year's budget. Also the scientific discipline evaluations feed into this decision-making process.²⁸ Budgets are

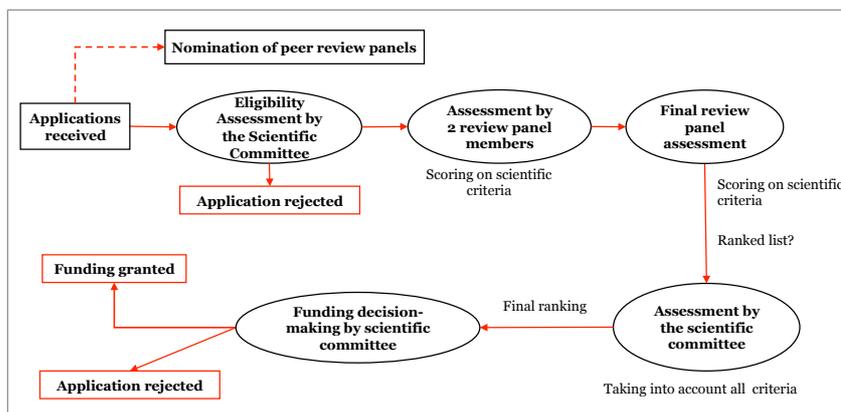
²⁸ Council of Canadian Academies (Appendix B and C) Informing research choices: Indicators and Judgment The Expert Panel on Science Performance and Research Funding, 2012

not allocated in advance to the different sub-panels. The Scientific Committee tends to accept the top half or two-thirds of the ranked proposals approved by the lower-level panels. It then selects which projects to fund lower down the rankings, so the cut-off point – and therefore the ‘budget’ at the panel level – is not predetermined.

The assessment process

Figure 24 maps out the process for the proposal appraisals in the FRIPRO scheme, further described below.

Figure 24 Proposal appraisal process for response mode funding - FRIPRO



Proposal submission

FRIPRO normally launches 1 closed call per year (according to the RCN website in the month of April, with the application deadline falling in June). Some calls are open-ended, that is, applications are accepted at any time, for example, the personal overseas research grant for social science researchers. Applications are to be made in English. Currently, the applicants choose which committee will handle the proposal – but not the individual scientific discipline panels. The RCN administration can suggest committee change to the applicants and in the end the administration decides which panel does what. The Research Council logs submitted proposals and members of the assigned scientific committee perform an initial eligibility review.

Proposal appraisal process

The assessment process has two stages: the (virtual) review panel performs a preliminary assessment, followed by a final assessment in the Scientific Committee.

The assessment by the peer review panel is in two steps. Two peer reviewers - a ‘principal assessor’ (reporter) and second assessor – perform the *initial assessment*, solely based on scientific criteria (the scientific merit of the project and the qualifications of the research group) and using a 7-point scale (see Table 12).

A final assessment of each application is made during the plenary meeting. Before this meeting takes place, it is the responsibility of the reporter to fill in the complete project evaluation form, and provide comments on strengths and weaknesses. This also includes applying the seven-mark scale to all applications. The secondary assessor provides more limited feedback.

The reporter presents the initial comments on each application, followed by comments from the second assessor and an open discussion. All members of the panel discuss each application, in order to ensure a thorough assessment of each proposal and enable the panel members to consider each proposal in relation to all grant

applications submitted. The panel may also request written assessments from external experts if needed.

The panel is responsible for preparing a unified written project assessment for each application. The RCN guidelines underline that there must be consistency in the final evaluation form between the written text, the criteria and the marks given. The final written assessment for each application should reflect the review panel conclusions as a whole (consensus). It is also sent to the applicant as scientific feedback once the allocation process is completed.

There seems to be some inconsistency in practice on whether at this point a ranked list is developed or not, by whom and how.

- The recent FRIPRO evaluation mentions, “In FRIMEDBIO, the RCN programme officers will normally put together a joint list based on the rankings from each panel, separating the highest ranked (proposed for funding), the lowest ranked (to be rejected) and a group of middle ranked to be discussed in the committee meeting. In the FRIHUM Committee, on the other hand, all applications are read by at least two committee members before the review meeting, and the RCN programme officers do not provide any tentative joint ranking lists.”
- The 2011 mandate and guidelines of the referee panels in the FRIMEDBIO committee requests the review panels to develop ranked lists based on scientific merit - with separate lists for the different types of proposals - and comment on the proposed budget for each of the ranked applications. The highest-ranking proposals are also listed separately, so for example, research projects ranked 6-7 are on one list, and personal fellowships ranked 5-7 on another. On the ranked list, each entry should be accompanied by an explanation as to why it was ranked higher than the next entry on the ranking.

The written overall assessment of each proposal is presented as a recommendation and forms the basis for the decisions taken by the Scientific Committees. The task of the scientific committee is to combine the results from the different panels into an overall ranking list and make the final decisions.

The guidelines state that during the scientific committee meeting, each type of proposal is dealt with separately. The committee is advised by the administration of the required balance between instruments, notably to ensure that a proportion of young researchers is funded.

Scientific merit is the most important assessment criterion, but the Committees also take into consideration the strategic guidelines set out in the call for proposals and other issues such as gender equality and recruitment.

We have not found any written account of how the FRIPRO criteria are prioritised (or not) in the programme as a whole. A RCN presentation of the FRIBIO scheme suggests (its) general priorities are i) high scientific quality, ii) research projects and postdoc grants, iii) plans for international collaboration, iv) female project leaders, v) disciplines.

RCN aims to identify interdisciplinary proposals when they are submitted, though there appear to be quite big variations in coding practice. These appear to make it difficult to develop a clear view of the effect of interdisciplinarity on success rates²⁹. RCN then has a responsibility to select appropriate peer reviewers that take account of the disciplinary context of the individual proposal. Panels are said to be increasingly interdisciplinary in character but there is not separate or special processing mechanisms for interdisciplinary proposals.

²⁹ Liv Langfeldt or Ranveig Røste, *Tverrfaglighet i Norges Forskningsråd: En analyse av kodepraksis og suksessrater for tverrfaglige søknader*, Rapport 3/2009, Oslo: NIFUSTEP, 2009

5.2.4 Response-mode funding of industry-oriented research - BIA

Description of the scheme

BIA, User-directed Research-based Innovation, was established in 2006 and funds bottom-up industry-oriented research. It has no thematic restrictions, but supports high-quality R&D projects with good business and socioeconomic potential. The RCN website has listed a number of characteristics of proposals it does not deem to be competitive, to guide potential applicants³⁰.

The programme received just fewer than 300 outline applications [*skisser*] for its January 2012 deadline, and just over 200 full applications for the second stage, which closed in February 2012. The programme budget is NOK450m over four years.

Administrative set-up

The BIA programme board consists of seven members and two deputies, nominated by the Board of the Innovation Division. The programme administration is responsible for coordination with other programmes and activities at RCN that share areas of overlap with the BIA programme³¹.

The assessment process

The overall assessment process of the BIA programme (Figure 25) mirrors the standardised approach of assessments in two phases, ie an initial assessment and a final assessment, and the use of an expert panel in the first phase.

For the BIA programme, the rules for the review panel's appraisal of innovation-oriented projects apply (see Section 5.2.2): *at least 3 panel members* should evaluate each application and consider the specific criteria for each individual project, *without making a ranking*.

The Panel assesses most of the criteria – level of innovation, value creation potential (for the industry partners), realisation of innovation, level of research, project quality, feasibility, innovation relevance of the research involved, and R&D risk. As the BIA programme sees both different disciplines and sectors competing for funding, emphasis is on the quality of the application. The panel must assess the application on its 'face value' and is not allowed to look up additional information about the application of research. The panel should reach consensus in its assessment and communicates the results to the programme administration in the form of a grade for each criterion.

We understand that in the last application round, 187 innovation project applications were assessed by 130 experts, predominantly Norwegian, during eight days.

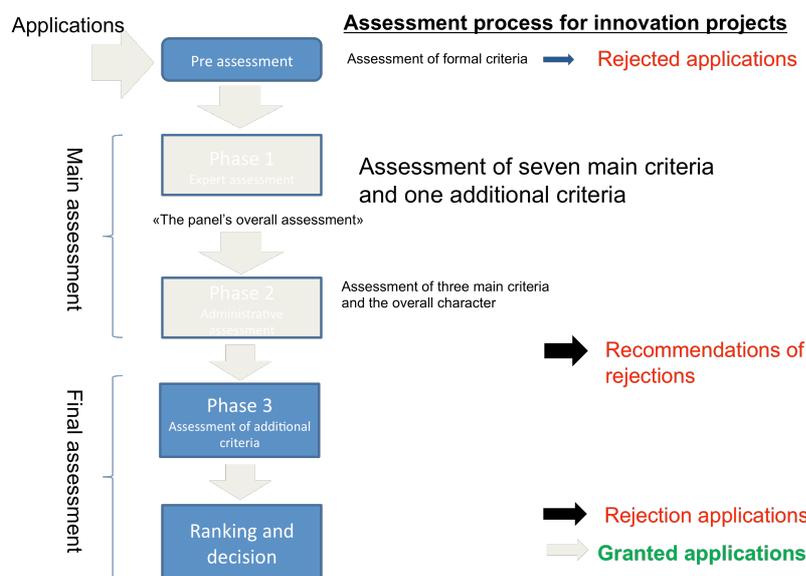
The RCN Administration is in charge of the second step in this phase of the process, assessing the proposals for additionality, other socioeconomic value and the quality of the documentation. The outcome of this first phase is a decision whether the project qualifies for funding or not. The administration then ranks the proposals according to a set of criteria that the Programme Board defined in advance, and presents the ranked list to the Programme Board. The Programme Board is in charge of the final assessment and assesses all proposals against a set of additional criteria, sets up a ranking, and makes the final funding decision.

A presentation on the BIA programme application assessments suggests the top criteria for funding are a combination of i) a real potential for value creation in Norway, ii) Innovation with a clear focus on commercialisation, iii) high scientific/technological quality of the research.

³⁰ Typiske kjennetegn ved søknader som ikke er konkurransedyktige

³¹ Work Programme for the BIA programme

Figure 25 BIA programme assessment of innovation projects



Source: our translation from Norwegian version obtained through study interviews

5.2.5 Proposal appraisal processes in the research programmes

Here we briefly describe the funding processes for a set of programmes that represent the different programme typologies: Large-scale programmes (RENERGI & VERDIKT), and Policy-oriented programmes (HAVKYST).

We could not find any significant difference in the processes for the two types of programmes; differences in procedures are at the level of proposal types (innovation-oriented versus researcher-driven projects).

VERDIKT, the Research Programme on Core Competence and Value Creation in ICT, is a RCN Large-scale programme, which runs 2005-2014. Its primary objective is to generate world-class expertise and value creation in the ICT field.

In its latest work programme, published in 2009, the programme set overall targets for distributing funding.

- Forty per cent to projects for applicants from research groups at universities, university colleges and independent research institutes (using the proposal types Researcher projects and ‘Competence-development with user involvement’ projects - KPN). Interdisciplinary projects and industry participation in researcher projects are viewed favourably.
- Forty per cent to projects for applicants from companies (User-directed innovation projects - IPN). Public institutions are eligible to apply too. Projects that give special attention to fostering activity by SMEs will be viewed favourably.
- Twenty per cent to other activities in keeping with the measures outlined above.

Following RCN guidelines, the Programme Board should comprise 3 representatives from the research sector (universities, university colleges and research institutes), 2 international experts in the field, 3 representatives from the industry sector, and 1 representative employed in an industry organisation or public institution.

RENERGI was one of the Large-scale programmes launched in 2004 and runs until 2013. It is aimed at industry and research and higher education institutions alike and aims to advance the development of the Norwegian energy sector. As a Large-scale programme RENERGI is complex, supporting technological, natural sciences and social sciences, ‘strategic’ basic research and applied research. It should also align with

national, as well as Nordic, European and international energy policy. The 2010-2013 budget is approximately NOK1.5bn.

The programme typically funds Competence-development Projects with User Involvement - KPN, User-directed innovation projects -IPN, and Researcher Projects. RENERGI allocates about 30% of available funding to KPNs, about 30% IPNs, and about 15% to Researcher Projects. The rest of the budget funds networking activities and the development of international strategy resources, such as participation in EU (eg ETPs) and international cooperation with China.

The programme administration exerts little steering for the IPN Calls, but specific requirements on the expected focus are set out in the calls. for the KPNs, which are intended to be capacity building, At times, in order to guarantee the balance between research and industry participation, separate calls are issued for KPNs and IPNs. In the case of the researcher projects, the RCN administration has observed that in the past, rather fragmented projects had been funded; now it strives for bigger, more networked projects with more researchers involved to stimulate the development of research groups and teams. The interviewees mentioned that ‘strategic’ basic research is also funded through the KPNs that involve many PhDs.

HAVKYST, the Oceans and Coastal Areas Programme, is one of the policy-oriented programmes, launched in 2006 and running until 2015. The programme is designed to i) develop basic knowledge for a future ecosystem-oriented, precautionary principle-based management system for marine ecosystems, ii) enhance value creation from ocean and coastal resources. It should also ensure an appropriate interface with other strategic programmes, industry-oriented programmes, and researcher-initiated basic research projects as well as basic research programmes. The budget is just under NOK90m per year, with expectations of an increase to at least NOK100m per year.

The current work programme has five thematic sub-programmes, each with an individual budget, and two cross-cutting activities reflecting the programme’s strategic objectives. There is usually one (virtual) review panel of three to six members per sub-programme and the RCN administration has also appointed an advisory group for the sub-programme “Long-term effects of discharges to the sea from petroleum-related activities”, which supports the programme board with calls for proposals, strategic activities and application processing.

HAVKYST provides support for basic and applied research and issues calls for proposals for Researcher projects, Competence-development projects with user involvement, Individual research grants for abroad, guest researcher grants, and support for events³².

Initially, HAVKYST published a large and broad call for proposals, that produced around 200 applications, but this resulted in a 5-10% success rate, which was considered too low. Consequently, the programme now calls only for some of the themes on alternate years – and this has lowered the number of proposals received to around 100 per year.

Criteria for assessment are based on the type of instrument(s) to be funded; additional criteria related to on representation from the North and international collaboration.

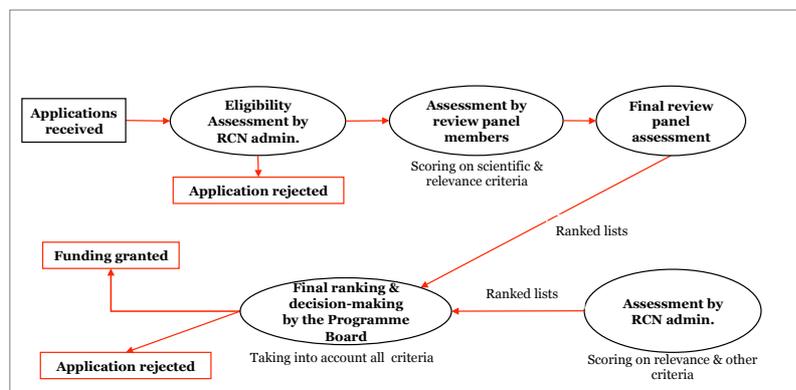
Description of the processes

The funding processes for the research programmes tend to follow the general application procedures, with some slight changes compared to the procedures adopted for the response-mode funding schemes, as illustrated in Figure 26, below.

³² The Oceans and Coastal Areas Programme (HAVKYST) 2006-2015, Work Programme Revised February 2010

Also in the case of the research programmes, the process starts with a selection of the proposals against the eligibility criteria defined and communicated in the call; this is the task of the RCN programme administration.

Figure 26 Proposal appraisal process for research programmes



Subsequently, the proposals are transferred to the review panels. The organisation, composition, and size of the panels may vary, depending on the programme characteristics and the typologies of proposals allowed.

The review panel assesses the applications in two steps as described for the FRIPRO programme, ie a preliminary assessment by 2 reviewers, followed by an assessment by the entire review panel.

In contrast to the procedures described for the response-mode funding schemes, the reviewers consider the scientific criteria (the scientific merit of the project and the qualifications of the research group) *as well as* the relevance ones. Once the review panel has reached a final decision, it drafts *ranked lists* (per type of proposal and level of scoring), and forwards the lists to the Programme Board

As mentioned in 5.2.1, different rules apply for innovation and researcher-driven projects. The RENERGI Work Programme specifies the implications in relation to the set-up and responsibilities of the review panels.

- Proposals for Researcher Projects and Competence-development projects with user involvement (KPN) are primarily assessed by international referees. Where feasible, the referees will convene for consensus discussions. The consensus process will provide the formal basis for application assessment
- User-directed innovation projects (IPN) will be assessed by national review panels. The programme administration will incorporate the panels' assessment into its recommendation to the programme board. Applicants who wish to have their applications for innovation projects treated confidentially must explicitly request this. In such cases applicants have the opportunity to comment on the proposed referees³³.

In the programmes the RCN programme administration assesses the applications, against the non-scientific criteria communicated in the call and sets up a ranked list. In the case of the HAVKYST programme, for example, RCN personnel assess the proposals against the criteria for relevance, ethics and environmental impacts.

The Programme Board receives the ranked lists and, according to interviewees, adopts the threshold of score 5, considering only proposals having scored 5-7. However, it views all the applications and has the right to re-mark any proposal, although

³³ RENERGI Work Programme Adopted by the Research Board of the Division for Strategic Priorities on 7 April 2010

interviewees stated that this has not yet occurred. It then makes the final finding decision.

5.2.6 Funding process for the Centres Programmes

As mentioned previously, major differences from the standard procedure for the funding process of the Competence Centres are the two-step approach and the final decision-making by the Executive Board of RCN, or a party authorised by the Executive Board.

Description of the schemes

The Centres of Excellence scheme (SFF) was launched in 2002. The first centres were established in 2003 (13 centres in total). In 2007 an additional eight centres won funding and were set up.

The SFF funding scheme establishes time-limited centres focused on long-term research of a high international quality, and where researcher training is central. Host institutions can be universities, university colleges or research institutes, who usually cooperates with one or more research institutions, organisations or enterprises in respect of the establishment, operation and funding.

High scientific quality is the main criterion for the selection of the Centres. The broader list of criteria includes: scientific merit; the project manager and project group (centre director and steering group); feasibility; international cooperation; national cooperation; value added generated by establishing the centre; and dissemination and communication of results. In addition the following factors are taken into account: relevance relative to the call for proposals, ethical perspectives, environmental impact, recruitment of women, and gender balance in the project.

The Centres for Research-based Innovation (SFI) scheme was introduced in 2007 with the objective of improving academic-industry links. The design was heavily influenced by the Swedish/Austrian designs of similar initiatives. The first SFI (14) centres were set up in 2007, with an additional seven set up in 2011. SFI schemes are intended to encourage enterprises to innovate by placing stronger emphasis on long-term research and foster the transfer of research-based knowledge and technology.

The SFI schemes can be funded for 8 years, but an extension of the first five-year period depends on the positive outcome of an evaluation after 3.5 years. Funding from RCN is approximately 10 million NOK per year; the host institutions and partners should match this. A university, university college, independent research institute, R&D-performing company or R&D-performing public service provider may act as host institution, provided it has the resources to meet the established requirements for an SFI centre.

The first call for proposals in 2005 was open: no themes were specified. The second call that was launched in 2010 aimed to fill thematic gaps in the portfolio and five areas were indicated: Private service sector, Public sector/health services sector, Transport, Food, and Environmental technology

The applications are assessed against two overarching criteria: scientific merit and potential for innovation and value creation.

Description of the processes

RCN adopts a two-step application process for the selection of the competence centres to be funded. The processes for the implementation of the first phase differ between the two schemes, with the SFF scheme performing a *pre-selection* while for the SFI scheme proposals are *submitted* in two rounds.

- In the SFF scheme, the pre-selection process is organised in two steps, giving the applicants have the right to reply after a preliminary assessment upon which the scientific expert committee assesses the proposal and suggest a pre-selection –

which is approved by the Executive Board. In the second round of the process, the review panels and committee consider only the pre-selected candidates.

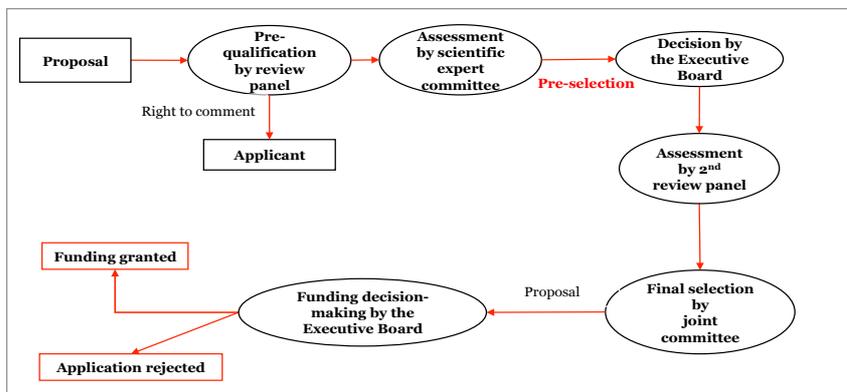
- In the SFI scheme, first a summary proposal is submitted and assessed and commented upon by the RCN Administration. The applicant can then decide whether or not to submit a full proposal.

The process in the SFF scheme

Proposals are assessed in two rounds.

- Prequalification: a panel of at least three international experts³⁴ (virtually) assesses all applications and develop joint statements, which are subsequently sent to applicants, who may in turn choose to reply with comments. If comments are made, the panel might revise its original statement. Following the initial assessment, three international expert committees (4-5 members each) are appointed. These cover natural science/technology, bioscience, and humanities/social science and their main task is to select 5 to 10 applications which they consider should advance to the final round. The final decisions by RCN's Executive Board are based on the application material, the statement of the referee panel and any comments made by the applicant
- Final selection: The virtual panel assesses each application again and an overall scientific committee of 7 to 10 members is set up, chosen from the three expert committees. This committee will rank all remaining applications on the basis of the final application, the statement of the referee panel, and interviews with those nominated as centre directors, along with the committee's own assessment.
- The list of prioritised applications is sent to RCN for a final decision, to be made by the Executive Board³⁵.

Figure 27 Proposal appraisal for the competence centres - SFF



The process in the SFI scheme

The two-step process for the SFI centres is made up of a first phase where a summary proposal is presented, eventually followed by the submission of a final proposal (Figure 28).

Step 1: Summary proposal: The guidelines for the SFI scheme state that the institutions seeking funding should submit a ‘mandatory outline’, i.e. a summary proposal’, that is assessed by the RCN administration. The RCN administration has a purely advisory role: no rejection of applications can be made. Feedback is given on the proposal to the applicants who can then use it to decide whether to proceed to a full proposal. Several institutions used the RCN feedback internally to select which applications to send forward.

³⁴ Applicants may propose the names of referees whom they consider to be qualified to assess the proposal

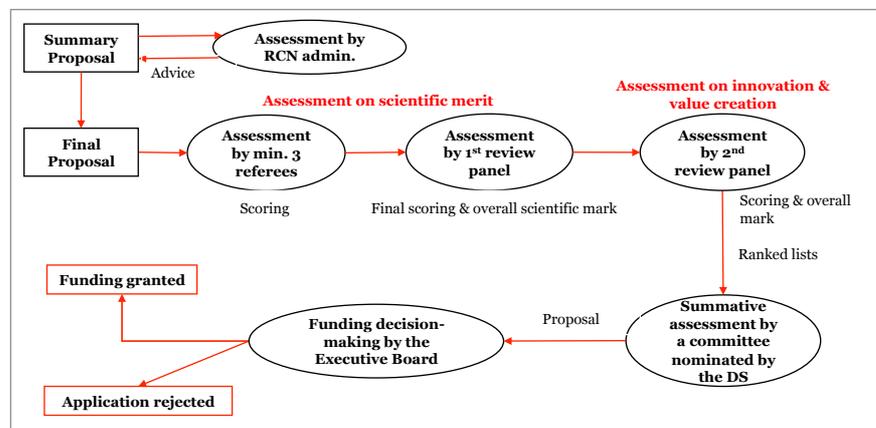
³⁵ SFF - Krav og retningslinjer

Step 2: Final proposal: The process has four phases: in the first phase, the proposal is assessed against the criteria for scientific merit by a first review panel; in the second phase, another panel assesses the proposals on the criteria related to innovation and value creation. A committee nominated by the Division Board makes a summary assessment and finally the Executive Board decides on the funding.

The reviewers of scientific merit are foreigners; those of innovation and value creation are nationals.

- Each proposal is first remotely assessed by a minimum of 3 referees against the scientific criteria, using the e-Assessment system. The scientific assessment is made against the criteria of scientific merit, project management, the research group, feasibility, international cooperation, dissemination of results and finally setting the proposal against the environment, ethics and gender equality requirements. These criteria are detailed in the call information.
- The assessment is then submitted to the scientific review panel. The panel undertakes a collective assessment of each application, ‘calibrates’ or normalises scores and judgements across different disciplines, gives an overall ‘science’ score and writes an overall assessment.
- The RCN administration then categorises the proposals into thematic areas for which a panel is set up of industry experts. In the two calls, there were three categories: life sciences and medicine; ICT and services; materials, construction, petroleum, processes.
- The proposals and scientific assessment reports are then passed on to the industry panels. These panels focus on the applications that received the overall scientific threshold of ‘very good’, but consider all applications to identify any with exceptional potential impact. They look at industrial and societal relevance, additionality, feasibility, project quality, national cooperation, international cooperation, and environment, ethics and gender; relevance and impact are the major criteria. The industry panel does a ranking (the other reviewers do not) and choose which not to rank (ie applications that are not worthy of support).
- The ranked lists are then forwarded to a committee appointed by the Division Board of the Innovation Division for a summative assessment. They look at the three ranked lists and decide which to fund, based on the budget. The Committee looks at innovation and impact but considers also other issues such as the fit with or gaps in the SFI portfolio and the relation to the Large-scale programmes. The RCN administration is present, advises where necessary, and tables a paper that sets out the background against which the committee may wish to make decisions.
- The Executive Board - or a committee with external experts appointed by the board - takes the final funding decision, based on the assessments and ranking, as well as other background material presented.

Figure 28 Proposal appraisal process for the competence centres - SFI



5.3 Success rates & score distributions in FRIPRO

In international practice, a balance is typically sought between the need to guarantee the maximum level of quality in the research funded while at the same time avoiding that the success rates fall below an acceptable level, which could cause de-motivation among the researchers to participate in future calls. While the scientific community tends to regard a success rate of 33% as a guarantee of competition, many research councils operate with lower rates.

In normal practice, policy makers interpret data related to success rates as follows.

- Low levels of eligibility typically indicate a lack of clarity in the call for tender documentation on the administrative requirements
- High success rates need to be looked into in-depth. They may point at a high efficiency in attracting quality researchers, but also at programme budgets that were established too generously and/or the urge of the funding bodies to prove efficiency by ‘spending the money’. Ultimately, they raise questions related to the ability of the programme managers to set up a truly competitive process, selecting only the best quality proposals
- Equally, low levels of success rates need to be scrutinised with care. One cause can be that the programme budget is too small to achieve its intended purpose. Another can be a general low quality level of the proposals, which may point at faults in the programme design (failure to attract the key players) or flaws in the system in terms of low quality assessment by the applicants before submitting proposals

Score distributions provide us with a view on the overall quality of the proposals submitted – partly explaining low success rates in the case of a large number of low-quality proposals. It also allows us to assess the adequacy of the overall budget available.

We focus our analysis on the bottom-up basic research programme FRIPRO, the highly competitive bottom-up basic research scheme. Average success rates in this programme are at 10%.

We analyse the success rates in this programme at various dimensions, in combination with score distributions, and analyse the patterns emerging against various dimensions (stakeholders, regions, scientific disciplines etc.).

We would have liked to enrich this analysis also with success rates and score distributions for other types of programmes. RCN was unable to provide us with score distribution data for a sufficient number of programmes to make such an analysis valuable and representative.

Table 13, however, gives an overview of the success rates in the other programme categories.

Table 13 Trend in success rates at programme/instrument level, 2007-2010

	2007	2008	2009	2010	Average
User-directed innovation programmes	66%	59%	47%	54%	56%
Basic research programmes	33%	33%	25%	42%	33%
Policy-oriented programmes	24%	26%	27%	25%	26%
Large-scale programmes	39%	36%	29%	33%	34%
Independent projects	16%	15%	14%	13%	14%

Source: RCN data, 2012

RCN has implemented – and is discussing further – changes to remedy to the low success rates in FRIPRO. For example, project leaders can from 2012 only manage one FRIPRO grant at a time, as a way of encouraging a wider breadth of FRIPRO participation. In addition, the budget ceiling has been set to NOK9m to facilitate a broader financial spread across applications, and it will become more difficult for

researchers with a permanent employment contract to win FRIPRO funds. The length of the project has been set to four years.

The recent NIFU evaluation³⁶ of the FRIPRO programme discusses in more detail the current and also possible future solutions to the intense competitiveness for funding. The study also examines applicant feedback on the programme. Applicants' views on FRIPRO are often strong, while acknowledging assessment of basic research is a difficult task. The NIFU report summarises the applicant response in the following way

Ensuring adequate expertise in all panels and for all applications is still a central challenge. The applications are diverse, and larger and broader applications may be difficult to assess. Informants suggested various ways to better ensure competence in the panels, including more panel members, separate panels for multidisciplinary proposals and proposals that do not fit into the disciplinary panels, and more frequent use of reviewers proposed by applicants.

The NIFU report also says, "A general concern of many of the informants was the low success rate and disappointed applicants not trusting the process."

The analysis below of success rates and score distributions in the FRIPRO programme is based upon data provided to us by RCN.

5.3.1 Overview of success rates and score distributions

In 2011, RCN received in total 965 applications for funding under the FRIPRO programme, for a total amount of 6,994 K NoK.

The overall success rate of the proposals was 15%: 145 proposals were funded, for a total budget of 1,118 K NoK (16% of the total funding applied for).

All of the 145 funded proposals had an overall score of 6 or above. In other words, only half of the proposals that had an overall assessment score of 6 reached funding.

There was a good distribution in quality of the proposals and the number of low quality proposals was relatively small.

- 30% of the project proposals – 290 proposals – had reached the threshold of score of 6 or above in their overall assessment
- Another third (35%) had overall assessment scores of 4 or below
- The remaining 33% scored overall 5.

In order to make a funding decision, the scientific committee clearly had to look into the detail of the scores for the different selection criteria. The data reported below show that scientific quality was indeed the major criterion, but success depended on optimal scores also for the other criteria. Overall there seemed to have been a fair level of rigour in applying the established selection criteria.

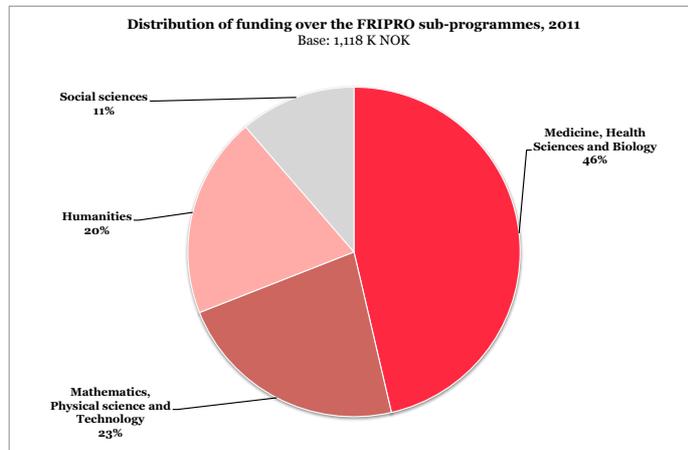
The RCN data list 4 criteria groupings: 'scientific quality' and the 'principal investigator and project group' scored on a scale 7-1; 'characteristics' [karakter] and 'dissemination' scored on a scale A-C. Proposals that scored 7 on scientific quality and at least 6 or B on the other criteria had ~85% chance of funding; 90% of the successful proposals (131 proposals) were proposals that had scored at least 6 or B on all criteria.

³⁶Liv Langfeldt, Inge Ramberg, Gunnar Sivertsen, Carter Bloch and Dorothy Olsen, *Evaluation of the Norwegian scheme for independent research projects (FRIPRO)* Report 8/2012, Oslo: NIFU, 2012

5.3.2 Analysis at the level of scientific committees

In 2011, close to half of the budget for the calls went to projects in the Medicine, health sciences and biology discipline area; the lowest share went to the Social Sciences sub-programme (approximately 10% - Figure 29).

Figure 29 Distribution of the budget among the FRIPRO sub-programmes, 2011



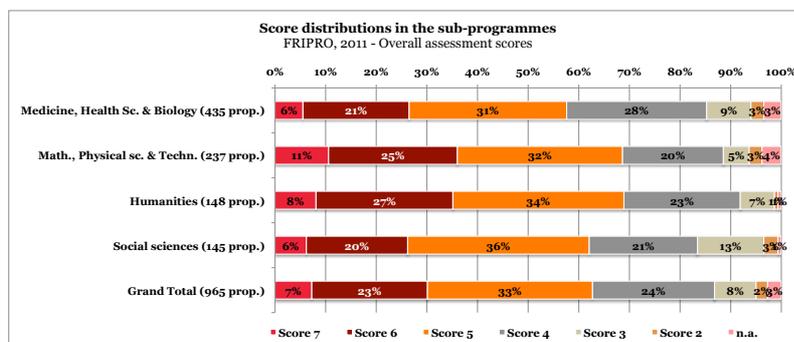
Source: RCN data – Technopolis analysis

The FRIMEDBIO programmes (Medicine, health sciences and biology) received the highest share of proposals (435), followed by the FRINATEK sub-programme (Mathematics, physical sciences and technology – 237 proposals), the FRIHUM one (Humanities – 148 proposals) and FRISAM (Social sciences -145 proposals). In proportion, there was therefore more budget available for proposals in the FRIHUM programme than in the FRISAM one.

The quality of the proposals received in the sub-programmes was very different (Figure 30).

- The FRINATEK and FRIHUM sub-programmes received ~35% of proposals that obtained an overall assessment score of 6+ and ~30% of proposals were top quality (scores 6+ or B+ for all criteria); only ~30% were low quality, scoring below 5
- The FRIMEDBIO and FRISAM sub-programmes received (only) ~25% of proposals that scored 6+, ~22% were top quality. In both sub-programmes, but especially in FRIMEDBIO, there was a higher-than-average share of ‘low-quality’ proposals (scores 5-), accounting for ~40% of the proposals

Figure 30 Score distributions in the sub-programmes



Source: RCN data – Technopolis analysis

The combination of the pre-allocation of the budgets for the sub-programmes with the quality level of the proposals, implied (Table 14)

- Higher-than-average competition in the FRINATEK sub-programme (40% of top-quality proposals were funded)
- Lower-than-average competition in the FRIHUM and FRIMEDBIO programmes (~55% of top-quality proposals funded)

Table 14 Success rates of the proposals in the FRIPRO sub-programmes

Sub-programme	Success rates overall	Success rates for top-quality proposals (6+ and B+ for all criteria)
Humanities (FRIHUM)	20%	56%
Mathematics, Physical science & Technology (FRINATEK)	14%	40%
Medicine, Health Sciences & Biology (FRIMEDBIO)	15%	56%
Social sciences (FRISAM)	12%	47%
Grand Total	15%	50%

Source: RCN data – Technopolis analysis

These data suggest there may be too little budget for bottom-up basic research in the fields of Mathematics, Physical science and Technology. This is confirmed by the data on the average scores of the funded proposals.

Table 15 Average scores of funded proposals in the FRIPRO sub-programmes

Programme	Average score all proposals	Average score funded proposals
Humanities	5.05	6.31
Mathematics, Physical science and Technology	5.07	6.65
Medicine, Health Sciences and Biology	4.78	6.33
Social sciences	4.76	6.33
Overall	4.89	6.4

Source: RCN data – Technopolis analysis

For an improved understanding of the underlying causes and patterns leading to these differences in success rates and score distributions among the sub-programmes, two dimensions are of particular importance.

- The different proposal types funded in 2011, ie the (individual) post-doc grants and the research projects grants, presented by research groups
- The stakeholders involved, including the different sectors as well as their distribution over the regions

We cover these topics in the sections below.

5.3.3 Analysis at the level of proposal/project type

The FRIPRO programme allowed two types of proposals: postdoctoral grants and research projects. Post-doc grants had a success rate of 11%, research projects of 16%.

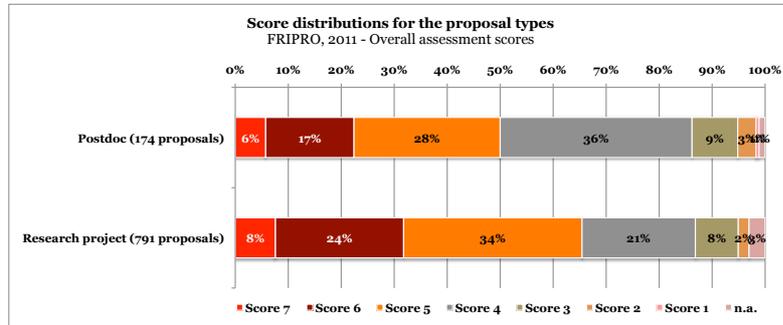
Data on the score distributions show that similar shares of project and post-doc proposals reached the threshold score of 6 (respectively ~30% and ~25%).³⁷ There was a large group of low quality post-doc proposals, though: ~50% scored below 5, compared to ~35% of the proposals for research projects (Figure 31).

- Low-quality post-doc proposals were especially in FRINATEK (55%) and FRIMEDBIO (55%); the highest share of proposals scoring 6+ was in FRINATEK (30%) and FRIHUM (26%)

³⁷ The FRIPRO programme foresees a threshold of 5 for post-doc grants and 6 for research projects, the actual thresholds applied seem to be score 6 for all types of proposals

- Research project proposals scored low especially in FRIMEDBIO (40%) and FRISAM (37%) and showed particularly positive results for FRIHUM (43%) and FRINATEK (36%) – similar to the post-doc proposals

Figure 31 Score distributions for the proposal types



Source: RCN data – Technopolis analysis

For both proposal types, top quality proposals had an overall 50% chance of funding. The probability was considerably higher for research project proposals in FRIHUM and for post-doc grants in FRISAM.

Table 16 Funding of top-quality proposals at proposal/project level

Sub-programme	Post-doc Grants	Research projects	Overall
Humanities	47%	60%	56%
Mathematics, Physical science and Technology	33%	41%	40%
Medicine, Health Sciences and Biology	50%	56%	56%
Social sciences	75%	44%	47%
Grand Total	49%	50%	50%

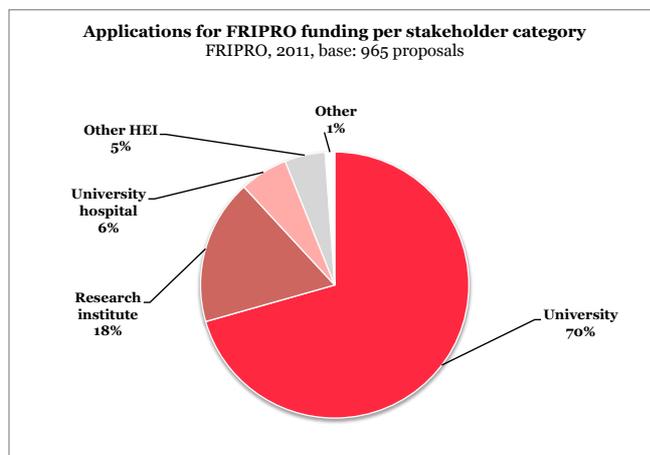
Source: RCN data – Technopolis analysis

The data also confirm the strong competition in FRINATEK, for both proposal types but especially for the post-doc grants.

5.3.4 Analysis at the stakeholder level

Researchers or research groups active in *universities* were the stakeholders applying most often for FRIPRO grants; their proposals accounted for 70% of the total in 2011. Proposals by researchers in the research institutes accounted for close to 20% (Figure 32).

Figure 32 Applications for FRIPRO funding per stakeholder category

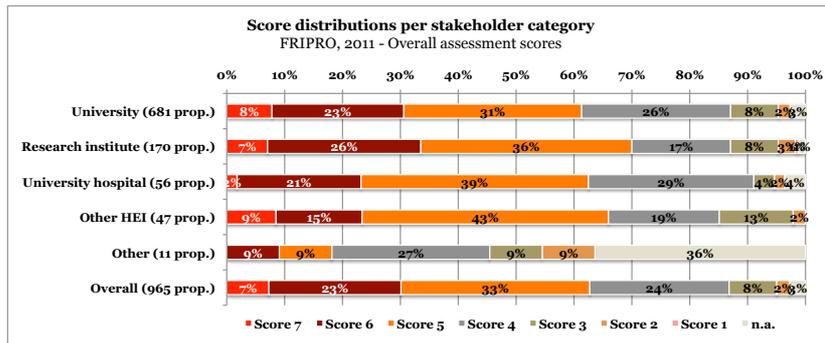


Source: RCN data – Technopolis analysis

There is a considerable difference in the quality of the proposals among the stakeholder categories (Figure 30)

- Approximately one third of the proposals presented by researchers in research institutes and universities got an overall score of 6+ (respectively 34% and 31%); only one in five researchers in the other higher education institutes and university hospitals reached this threshold (23% of the proposals)
- The number of low quality proposals was particularly high in the universities and university hospitals (~40%), compared to 30% in the research institutes. This points at an insufficient quality management of proposals prior to submission in universities and university hospitals

Figure 33 Score distributions, overall and per stakeholder category



Source: RCN data – Technopolis analysis

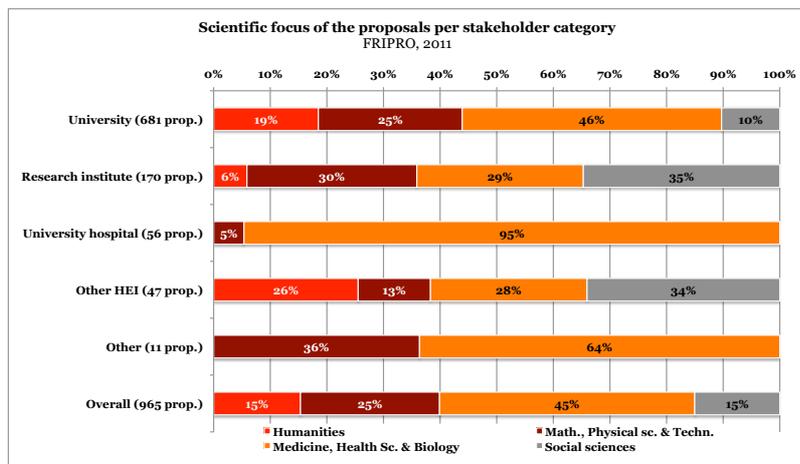
The data on the success rates appear to be in contradiction with the findings on the overall quality of the proposals: success rates ranged from 19% for the universities to 6% for research institutes, 4% for other Higher Education institutes, and 2% for university hospitals. However, there are two factors that must be taken into account here: the scientific focus of participation by these stakeholders – and therefore the level of competition they were subject to; and closely related to this factor, the scoring on *all* selection criteria. Universities and research institutes had similar results in relation to the latter: respectively 27% and 29% of their proposals were ‘top quality’, compared to 18% for the university hospitals and 17% for the other HEI institutions. In other words, the major influencing factor was the level of competition in the various scientific fields.

Stakeholders focused on different scientific disciplines (Figure 34):

- Universities predominantly submitted proposals in the FRIMEDBIO programme (~50%); one out of four (~25%) was directed to the FRINATEK programme
- Proposals by research institutes were distributed between the FRISAM programme (35%), the FRINATEK programme (30%) and the FRIMEDBIO programme (29%)

Taking into consideration the different levels of competition in these fields, which was particularly high in the FRINATEK programme and relatively low in the FRIMEDBIO programme, overall, proposals by the research institutes had a lower probability of success.

Figure 34 Applications for FRIPRO funding in the sub-programmes per stakeholder category



Source: RCN data – Technopolis analysis

5.3.5 The regional dimension

At the regional level, close to 50% of the proposals (47%) were presented by researchers located in the region Hovedstaden (Oslo and Akershus), followed by researchers in Vestlandet (24%), Midt-Norge (14%) and Nord Norge (11%).

There were significant differences in the success rates for proposals at the regional levels and a particularly high success rate – 23% - for proposals presented by researchers or research groups located in Northern Norway (Nord Norge) (Table 17

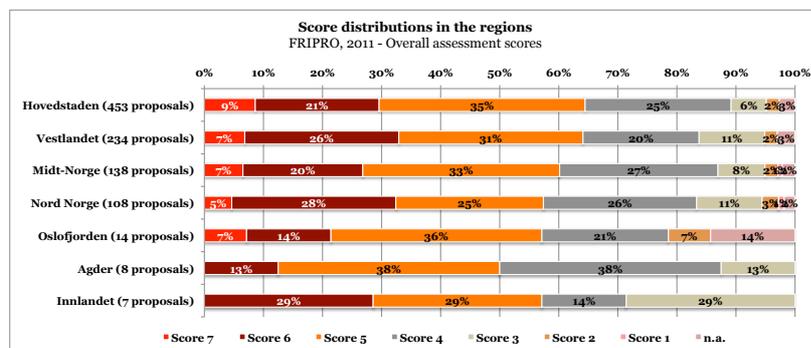
Table 17 Success rates in the regions – FRIPRO

Region	Success rate in the region	Total proposals
Hovedstaden	15%	453
Vestlandet	15%	234
Midt-Norge	10%	138
Nord Norge	23%	108
Oslofjorden	0%	14
Agder	13%	8
Innlandet	0%	7

Source: RCN data – Technopolis analysis

A first explanation is to be found in the difference in quality level of the proposals. Close to 35% of the proposals by researchers located in Nord-Norge and Vestlandet reached an overall assessment score of 6+, compared to 30% of those from actors in Hovedstaden and 27% for Midt Norge. There was also a higher-than-average number of low quality proposals in the regions of Midt-Norge and Nord Norge.

Figure 35 Score distributions in the regions

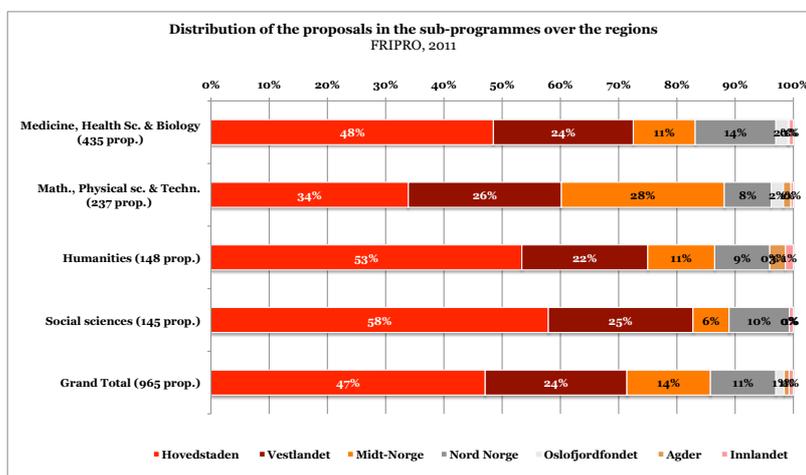


Source: RCN data – Technopolis analysis

A second determining factor was the scientific focus of the research proposed by the actors in the different regions and the level of competition in the scientific fields.

Close to half of the proposals by researchers in Midt Norge, for example, focused on the highly competitive field of FRINATEK, while close to 60% of the proposals by researchers in Nord Norge were submitted in the field of FRIMEDBIO (Figure 36)

Figure 36 Distribution of the proposals in the sub-programmes over the regions



Source: RCN data – Technopolis analysis

5.3.6 Analysis at the level of the universities

Given the strong participation by universities, participation at regional level is largely driven by the participation by the different universities. Table 18 shows the significant participation by the University of Oslo (UiO) and the University of Bergen (UiB), and to a lesser degree the NTNU and the University of Tromsø (UiT). Overall, close to half of the proposals were submitted for the FRIMEDBIO programme while a quarter (25%) focused on the highly competitive FRINATEK one. Most of the universities focused on FRIMEDBIO, with the exception of NTNU (FRINATEK was the preferred programme) and the University of Agder that presented a small number of proposals in the FRINATEK and FRIHUM programmes.

Table 18 Proposals for the FRIPRO sub-programme by the universities

	FRIHUM	FRINATEK	FRIMEDBIO	FRISAM	Grand Total
UiO	27%	19%	43%	11%	245
UiB	13%	24%	53%	10%	163
NTNU	13%	48%	35%	4%	121
UiT	15%	18%	55%	12%	91
Univ. for miljø- og bi	4%	21%	50%	25%	28
Univ. i Stavanger	16%	21%	42%	21%	19
Univ. i Agder	50%	50%			6
Univ. i Nordland			75%	25%	4
UNIS Svalbard			100%		3
Overall	19%	25%	46%	10%	680

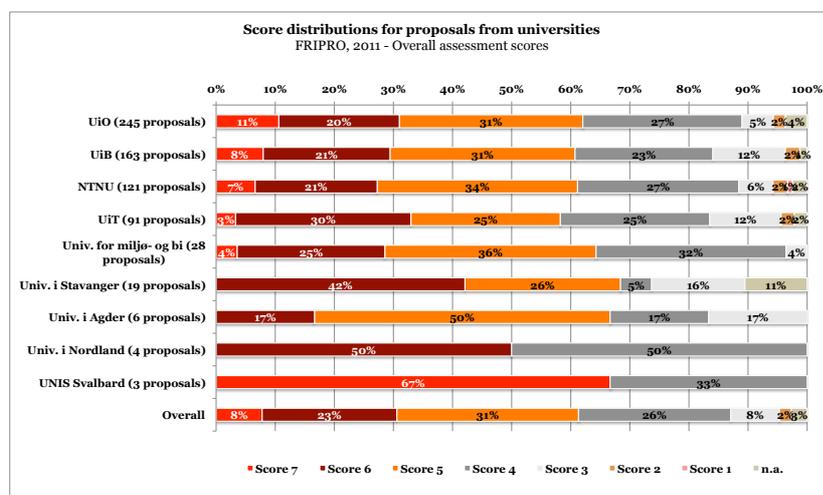
Source: RCN data – Technopolis analysis

The score distributions for the different universities indicate in particular a more careful selection of proposals to submit among the ‘minor’ universities (Figure 37)

- The major universities all had approximately 30% of their proposals scoring 6 or above – the least successful was NTNU with 27%; the most successful the University of Tromsø (UiT) with 33%
- The number of low quality proposals was high for all major universities, but much lower for most of the ‘minor’ universities

- The University of Stavanger, the University of Nordland, and the UNIS in Svalbard submitted few proposals, but had a higher-than-average share of quality proposals

Figure 37 Score distributions for proposals from universities



Source: RCN data – Technopolis analysis

Data on the top quality proposals furthermore indicate higher-than-average levels of such proposals submitted by the UNIS (67%), the University of Stavanger (32%) and the University of Tromsø (32%). The proposals by NTNU and the University of Bergen showed lower-than-average shares of top quality proposals (respectively 23% and 24%). For the University of Agder, only 1 proposal out of the 6 achieved these scores.

Table 19 Top quality proposals from universities

	FRIHUM	FRINATEK	FRIMEDBIO	FRISAM	Overall
UiO (245 prop.)	25%	47%	26%	12%	28%
UiB (163 prop.)	18%	28%	21%	38%	24%
NTNU (121 prop.)	6%	29%	21%	20%	23%
UiT (91 prop.)	57%	31%	26%	27%	32%
Univ. for miljø- og bi (28 prop.)	100%	17%	21%	29%	25%
Univ. i Stavanger (19 prop.)	33%	25%	50%	0%	32%
Univ. i Agder (6 prop.)	33%	0%			17%
Univ. i Nordland (4 prop.)			33%	0%	25%
UNIS (Svalbard - 3 prop.)			67%		67%
Grand Total	26%	33%	25%	21%	27%

Source: RCN data – Technopolis analysis

Comparing these data with the success rates, we see that the final outcomes are in line with, on the one hand, the focus of participation and the related level of competition, and on the other hand, the number of top-quality proposals presented by the universities. (Table 20)

In this context one should also take into account that budgets were pre-allocated by the Scientific Committees also at the more detailed discipline level.

Table 20 Success rates for proposals by universities in the sub-programmes

	FRIHUM	FRINATEK	FRIMEDBIO	FRISAM	Overall
UiO (245 prop.)	18%	28%	23%	15%	22%
UiB (163 prop.)	23%	15%	17%	25%	18%
NTNU (121 prop.)	13%	12%	10%	0%	11%
UiT (91 prop.)	29%	25%	22%	27%	24%
Univ. for miljø- og bi (28 prop.)	0%	33%	21%	29%	25%
Univ. i Stavanger (19 prop.)	33%	0%	25%	0%	16%
Univ. i Agder (6 prop.)	33%	0%			17%
Univ. i Nordland (4 prop.)			33%	100%	50%
UNIS Svalbard (3 prop.)			33%		33%
Average	20%	18%	20%	20%	19%

Source: RCN data – Technopolis analysis

5.4 Key findings in the light of international experience

5.4.1 Summary of the main findings

A major change compared to the situation in 2000 is the increase in efficiency of the appraisal process processes. RCN has now standardised procedures for all activities in the management of the funding process, call dates are established centrally, and the entire process has also been thoroughly digitalised, including a portal for the remote handling of the proposals ('virtual' review panels). Deadlines set for the publication of the calls (6 to 10 weeks) and the proposal handling process (60 working days) are short and stringent. In the FRIPRO programme, we note particularly short lead times from application to decision-making (25 weeks, compared to 48 weeks in ERC).

In relation to innovation programmes, however, industry interviewees criticised the short lead-time between proposal publications and the deadline for proposal submission. They argued this was incompatible with normal industry practice. Industry would in any case prefer open to closed calls.

In general, RCN adopts a one-step application process; exceptions are the Centres programme and the recently launched research infrastructures programme. For the Centres of Excellence, the two-step process is essentially a two-phase appraisal procedure, with right to comment after the preliminary assessment by the review panel that informs the pre-selection of the proposals. A full 2-step process is implemented for the Competence Centres (SFI) where the applicant receives written comments on the preliminary proposal, assessed by the RCN administration, and can then decide whether to submit a full proposal.

RCN personnel are available for consultation before proposal submission and their full contact details are provided in the call information; no post-submission or post-assessment discussions with applicants are included in the procedures.

We also note the lack of some measures that could contribute to an enhanced efficiency in appraisal management – in particular the lack of a system allowing for the tracking of application histories and the monitoring of success rates and score distributions over time as a common practice. The fact that applicants can simultaneously apply for multiple programmes is a measure of user-friendliness but no doubt puts additional strain on RCN management. The score distribution analysis regarding the FRIPRO programme also pointed to inadequate quality control of proposals by the submitting institutions, in particular by universities and university hospitals.

RCN pays a lot of attention to transparency issues, including access to full information on selection criteria and proposal submission requirements. Upon assessment, the applicant has full access to all details, including the names of the referees. He/she is also provided with full feedback. Information on the overall budget is provided in the call information.

In almost all of the funding schemes that we assessed – including the response mode funding of basic research – budgets are pre-allocated among themes or disciplines and instruments (ie project types). This is directed by the programme plan identifying the envisaged portfolio of instruments or themes covered, and the annual action plans that are based upon a monitoring of the adherence to the programme plan by means of project portfolio and gap analyses. The only apparent exception to this approach is the BIA programme, providing response-mode funding for innovation-oriented research.

There is room for improvement in the amount of information to the applicants on these pre-allocated budgets at the level of proposal types or themes/topics subject to the specific call. This would allow the potential applicant properly to consider the cost efficiency of his/her application.

The measures to guarantee fairness and objectivity in the system are overall in line with international practice. An important change from this perspective is the use of peer review panels, which have been adopted in most programmes. Applicants can object to a referee and due attention is dedicated to the gender issue.

The system is also characterised by a certain degree of flexibility, allowing for transfer of an application to a different programme during the eligibility assessment process.

RCN's fair use of the different selection criteria is a topic of discussion in the research community and from this perspective there is room for improvement in the call information. It currently does not include clear indications on the weighting of the different selection criteria. This may underlie some of the impressions of unfairness within the research community.

There are differences in the responsibilities for the assessment of specific selection criteria. Given the differing purposes of the programmes, however, these differences appear to be appropriate.

- In BIA,
 - The panel assesses most of the criteria, including the level of innovation, value creation potential (for the industry partners), realisation of innovation, level of research, project quality, feasibility, innovation relevance of the research involved, and R&D risk
 - Only the RCN administration assesses additionality, other socio-economic value and the quality of the documentation
- In FRIPRO the review panel assesses the scientific criteria, the scientific committee all criteria
- In the Programmes, the panels assess the scientific criteria and the relevance; the RCN administration, relevance and the other criteria

Specifically regarding the FRIPRO programme, there is an adequate number of peer reviewers reading the proposals and decision-making is collective, which should contribute to fairness and objectivity.

A key feature of the programme is the pre-allocation of the budgets at scientific area level (by the Division Board and based on 'corrected' historical allocations) and subsequently at scientific discipline level within each area by the Scientific Committee.

Our analysis of success rates and distribution scores shows that the levels of budget for specific disciplines rather than the quality of applications drive competition levels and success rates.

The handling of the interdisciplinary proposals is another issue, linked to the pre-allocation of budgets at scientific area and in particular at the discipline level. The recent evaluation of FRIPRO³⁸ reported on concerns in the research community about the adequacy of the expertise in the review panels. Suggestions for improvement

³⁸ NIFU Evaluation of the Norwegian scheme for independent research projects (FRIPRO), Rapport 8/2012

included separate panels for multidisciplinary proposals or for proposals not fitting disciplinary panels. The report also commented on the higher satisfaction rate on the competence of the review committees among funded FRIPRO applicants than non-funded ones (3.7 on average for the former, 2.9 on average for the latter). NIFU considered, “This may indicate a general higher satisfaction of the funded applicants, or that applicants whose competence match that of the review committee have a higher chance of being funded (better match because they for instance belong to mainstream research areas, and do not require specific interdisciplinary or uncommon competence).”

RCN has done two things to improve the handling of interdisciplinary proposals. One is at the organisational level, by defining broader scientific areas to be covered by the scientific committees and choosing the review experts on an ad-hoc basis depending on the disciplines covered. The other is in its communication with the applicant. The applicant chooses the scientific committee for the assessment procedure, but the choice is considered and eventually discussed with the applicant by the RCN administration.

5.4.2 Input from international practice

For the comparison of the funding processes in RCN with international practice, we identified a set of similar programmes or funding schemes in Councils abroad, listed in the table below.

Table 21 Assessment Process Comparators

Norwegian Assessment Comparator(s)	Assessment Process	Council	Country
FRIPRO	Bottom up funding	NSFC	CN
		FFG	DE
		Academy of Finland	FI
		VR	SE
		EPSRC	UK
		ESRC	UK
HAVKYST RENERGI VERDIKT	Programmes	EPSRC	UK
		Tekes	FI
		VINNOVA	SE
SFF	Sonderforschungsbereiche (SFBs)	FFG	DE
	Centres of Excellence	Academy of Finland	FI
		VR	SE
SFI	Basisprogramme	FFG	AT
	Berzelli Centres	VR & VINNOVA	SE

In this section we focus on a set of specific topics emerging from our analysis:

- The organisation of the application process in terms of open or closed calls and one- or two-step applications as well as the degree of consultation with applicants
- Focusing on the response-mode funding processes, we look into success rates and the pre-allocation of budgets, the selection criteria applied, and last but not least, processes for the handling of interdisciplinary proposals in bottom-up funding schemes

The organisation of the application processes

The evidence collected in this exercise confirms RCN’s adherence to common international practice in relation to its **response-mode funding process** - or at least the ones applied in the Nordic countries.

There is a mix of approaches to the call procedures for response-mode funding (Table 22). The Swedish, Chinese and Finnish councils in our sample launch only closed calls (like RCN); the German and UK councils have open calls. Generally, bottom up

funding is applied for through a one-step application process. Applications are checked first (screened for basic eligibility) by in-house staff and thereafter forwarded to peer reviewers.

Calls for proposals are advertised openly on funding agency websites. Although time lines and windows vary, we have not found any information suggesting that calls are published less than a month before the deadline. The closing dates tend to fall around the same time every year, and should therefore not come as a surprise to the research community.

The UK Research Councils’ website tend to contain a large amount of generic information (FAQs, funding guides etc) for potential applicants, and also recurrently encourage researchers to contact the council with questions when/before considering submitting an application. They are also the only Councils inviting the applicants for interview before the applications are sent through for final assessment.

Table 22 International practice - appraisal procedures for response-mode funding

	Open/closed calls	One-step or two-step applications	Consultations during the application process
CN: NSFC	Closed annual call	One-step	Not required (applicants apply to their host institution, not NSFC)
DE: DFG	Open	One-step	Possible
FI: AKA standard procedures	Closed calls (two rounds in april and September, depending on calls)	One-step	Not required
SE: VR	Closed annual call (applicants apply for one of the selected areas of science)	One-step	Not required
UK: EPSRC (Standard grant)	n.a.	One-step	Before proposals are considered at review panels, applicants are invited to respond to the reviewers' comments
UK: ESRC Research grants	Open call	One-step	

A slightly different picture emerges when comparing practice for the appraisal procedures in programmes. In this case, both Vinnova and the EPSRC tend to adopt multiple step procedures. Most importantly, in all cases, proposals are discussed with the applicants – if not all, at least the pre-selected ones.

The UK’s EPSRC programme grants are only awarded to strategic projects, i.e. projects must address significant research challenges. Applicants must discuss their suitability for programme grant funding with an identified EPSRC contact before submitting an outline application. The EPSRC uses a three-stage proposal process

- A pre-outline stage involving a discussion on the proposed research with a programme grant manager, who may advise against taking the application any further
- An Outline stage, where a tentative application is made which is subsequently assessed against the following criteria: quality of research, national importance, added value, overall vision and ambition, leadership quality, management strategy, impact and advocacy for the engineering and physical sciences. An internal panel assesses the outline proposal
- Full proposal, which will be submitted following an outline meeting between the applicant(s) and the EPSRC.

The Finnish Tekes Technology Programmes organise annual or bi-annual targeted calls for universities and public research institutes to apply for the programme. Tekes experts assess the applications and decide on the funding after discussions with the principal investigator. The assessment covers market need, novelty value, competitive

situation and customer benefits of the innovation proposed as well as the effectiveness of Tekes funding.

VINNOVA’s programme funding calls tend to be made in two steps, of which the first step involves inviting outline proposals. These are subsequently assessed and the strongest proposals invited to proceed to step two.

Table 23 International practice – appraisal procedures for the programmes

	Open/closed calls	One-step or two-step applications	Consultations during the application process
FI: Tekes	Annual or biannual closed calls	One-step	Discussions between Tekes experts and applicants
SE: VINNOVA Innovations for Future Health Programme	Closed fixed calls	Two-steps	Selected proposers are called in for interviews
UK: EPSRC Programme Grants	Two annual closed calls	Three-step	<ul style="list-style-type: none"> • Discussions at the pre-outline stage between EPSRC and applicants • Interview of all applicants with sufficiently favourable reviewers’ opinion during review of the full proposals

Looking at general trends within the comparator countries, we can pick out the following trends regarding funding assessment of centre programmes.

Similar to RCN, in most cases proposals for Centres are appraised through a two-step process; only for the Vinnova/VR Competence Centres and the Finish Centres of Excellence programmes, calls are closed.

In contrast, initial applications for DFG centres are welcome on a continuous basis and are assessed twice per year by the Foundation’s Grants Committee on Collaborative Research Centres.

DFG also uses a two-stage submission process for its Collaborative Research Centres (CRC) programme. In the preliminary review process the proposal is assessed in a counselling interview regarding whether it has the appropriate justification and it meets all the criteria for receiving funding for setting up a Collaborative Research Centre. This preliminary review is done by the CRC Senate Committee, five researchers / experts in the field and by employees of the DFG Head Office. In the second phase, the panel is composed of 10 independent relevant experts including at least one member of a DFG Review Board.

Interviews with applicants are also used in the process for the VINN Excellence Centres, but only at the stage of the final proposal.

Table 24 International practice – appraisal procedures for the Centres

	Open/closed calls	One-step or two-step applications	Consultations during the application process
DE: DFG Collaborative Research Centres (CRCs)	Open call	Two-step	Interviews with applicants (at the stage of Pre-proposal)
FI: AKA Centres of Excellence	Closed annual call	Two-step	n.a.
SE: VINNOVA VINN Excellence Centres	Open calls	Two-step	Interview with applicants (at the stage of the full proposal)
SE: VINNOVA & VR Berzelii Centres	One-time closed call	n.a.	n.a.

Response-mode funding

The FRIPRO success rates (15% on average) are low compared to the success rates in our comparator councils (Table 25). The lowest success rates were around 20%, ie at a similar level of FRIPRO’s most ‘successful’ sub-programme for the humanities

sciences. In the UK the success rate appears to vary between 33-37%, while for the Swedish Research Council it is around 20%. The DFG success rate is higher, at about 40% for all disciplines.

We have information on the pre-allocation of budgets only for the UK EPSRC and the Swedish Science Council. In the UK, funding decisions taken by peer review panels tie into the overall funding milieu. The EPSRC Chief Executive explained in a recent statement to parliament³⁹ that review panels are informed by the EPSRC administration about the existing project portfolio, how that fits within the national importance and the strategic intentions of the EPSRC regarding the research base. Budgets between the four scientific areas (physical sciences, engineering, ICT and mathematics) are pre-allocated by the EPSRC administration based on strategic decisions on where support is needed and which areas to reduce or increase. He stressed, however, that the key individual decisions are based on excellence as judged by the peer review panels and the key criterion for funding and budget spending is the quality of the proposals received.

In Sweden, VR's evaluation panels assessing scientific disciplines have control over a budget and can therefore assess the appropriateness of an application's project budget vis-à-vis the project implementation. The panels may suggest budget changes (cuts), but the final award decision lies with the Research Council's scientific councils.

Table 25 International practice - Success rates & pre-allocation of budgets for response-mode funding

	Pre-allocation of budgets	Success rates (% of submitted proposals)
CN: NSFC General Programme	n.a.	18-20% (2010)
DE: DFG <i>Sachbeihilfe</i>	n.a.	About 43% in 2010 (average of the success rates by discipline)
SE: VR	Yes (budget by evaluation panels)	About 20%
UK: EPSRC Standard grant)	Yes	33% (2010-2011)
UK: ESRC Research grants	n.a.	23% (latest round of funding decisions, April 2012) - 16.3% (2011)

Note: Data on success rates in the Academy of Finland were not available

RCN is overall in line with international practice in relation to its selection criteria – even though there are some country-specific differences. Mapping the selection criteria applied in the different councils into the categories adopted by RCN, we note similarities in the scientific criteria (merit, teams, feasibility and dissemination), but only one of the other councils (the Finnish Academy of Sciences) explicitly indicated the level of national and international cooperation as criterion.

The criterion of relevance varies in importance and meaning. For the German DFG, relevance implied the expected advancement of knowledge and scientific significance as well as broader impact in terms of policy, commerce, technology, etc. The Finnish Academy specifically looks into the significance of the research project for the promotion of professional careers in research and researcher training. In the UK Councils criteria such as national relevance and 'value for money' are taken into account.

Several of the Councils also took the promotion of young researchers and gender equality into consideration.

³⁹ Unrevised transcript of evidence taken before The Select Committee on Science and Technology Inquiry on Research Councils *Evidence Session No. 1. Heard in Public. Questions 1-50*, Tuesday 17 July 2012 11.30 am. Witnesses: Dr Graeme Reid, Prof David Delpy, Prof Rick Rylance and Prof Duncan Wingham,

Table 26 International practice – Selection criteria for response-mode funding proposals

	Scientific merit	Project manager and project group	National and/ or International cooperation	Feasibility	Dissemination and communication results	Relevance	Other
CN: NSFC General Programme	√	√		√	√		Innovativeness of the proposal Interdisciplinary research actively supported
DE: DFG <i>Sachbeihilfe</i>	√	√		√	√	√	Diversity and equal opportunities
FI: AKA	√	√	√	√		√	
SE: VR	√	√		√			
UK: EPSRC Standard grant)	√	√			√	√ (national relevance)	Resources and management
UK: ESRC Research grants	√				√		Innovativeness of the proposal Value for money

The handling of multi-disciplinary proposals is an issue for most of the Councils and we highlight here a measure adopted in the Swedish Research Council that intends to at least partially tackle the problem.

The procedure adopted in this Council foresees two ranking processes for quality proposals by the review panels and a funding re-distribution process. The first ranking of the proposals by the review panels determines which proposals can be funded based upon the available budget. Those applications that fall outside of the evaluation panel's budget are then ranked for further review and become part of the 'redistribution process'.

Each review panel can also select one application relating to new areas and multidisciplinary and cross-disciplinary studies that cannot be awarded a grant within the evaluation panel's regular framework. The written evaluation of this application must explain the application's merits in relation to new areas and multidisciplinary and interdisciplinary studies.

It is then the task of the central redistribution group to recommend a number of applications from the evaluation panels for funding. This process takes place after all the evaluation panels have held their meetings and is intended to make sure that very good proposals get selected irrespective of the scientific field.

6. RCN's Institutional Boundaries

In this Section of the report we look into RCN's institutional boundaries with its two sister agencies in the RD&I system: SIVA and Innovation Norway. The intent of this analysis was to verify the clarity of the division of roles, evaluate the level of cooperation between the agencies, and identify any potential overlapping areas of competence.

We first set out the background to this analysis by describing the agencies' remits, the collaboration schemes and the agencies' activities. In Section 6.2 we cover the cooperation agreement between the agencies and then report on the evidence collected – in the context of this study and in the SIVA and INVANOR evaluations – on the quality of interaction between the agencies. We summarise our main findings in Section 6.4.

6.1 Background

SIVA, Innovation Norway and RCN are the three main players in the national RD&I, industry and business support system. Although the three agencies have dedicated different roles, responsibilities, and tasks, to ensure an effective and efficient system they have been asked by the government to keep in close dialogue and cooperation within activities and areas where there is common interest and a risk of overlapping responsibility and action. In particular, the three agencies work together in local and regional environments, and through the programmes ARENA⁴⁰, which supports regional business clusters, and the Norwegian Centres of Expertise (NCE).

In short, the contrasting roles of the agencies could be described as follows

- SIVA's investments are geared towards [physical] investment aiding innovation, while RCN's focus is on creating commercial and social value out of research.
- Innovation Norway's contributions are geared towards creating socioeconomic benefits from entrepreneurship, business growth and innovation.
- In contrast to SIVA, Innovation Norway and RCN both base their support in individual enterprises and projects, which are in turn encouraged to create networks. SIVA, on the other hand does not support individual undertakings, focusing instead on the development of physical and organisational infrastructure.

Nationally, contact with INVANOR is mainly undertaken through RCN's Innovation Division.

6.1.1 Agency remit – SIVA and Innovation Norway

SIVA

SIVA – the Industrial Development Corporation of Norway works to develop regional and local industrial clusters (knowledge networks as well as innovation centres). The corporation's main instruments are (ownership in) real estate and infrastructure. SIVA stems from 1968 (then known as *Selskapet for industrivekst*) and its original task was to support the development of industrial infrastructure in targeted areas in rural Norway. SIVA's tasks have developed since it was established and today

SIVA's main objective is to contribute to the achievement of the Norwegian government's policy goals in remote areas, and within this

⁴⁰ www.arenaprogrammet.no

framework contributes to unleash innovation capability and increase wealth creation in all parts of the country.⁴¹

Thus, the agency nowadays is not tied to supporting prioritised areas, nor does it operate exclusively in rural parts of Norway, although SIVA is still responsible for facilitating growth in the regions.

SIVA operates through three main areas – Real Estate, Innovation, and International, which appear to operate separately. In particular, international activities appear to be undertaken largely through the framework of the Barents Euro-Arctic cooperation⁴².

In total, SIVA has ownership in 150 companies including subsidiaries. SIVA's total investments in 2009 were around NOK700m⁴³.

Innovation Norway

Innovation Norway (INVANOR) is the main instrument for innovation and development of Norwegian businesses and industry. The ownership lies with the Ministry of Trade and Industry (51%), and as of 2010, also with the Norwegian counties (49%) (*fylkeskommunene*). It administers funding from the Ministries of Local Government and Regional Development, Fisheries and Coastal Affairs, Agriculture and Food, and Foreign Affairs, and from the regions (*fylkesmennene*). There are regional INVANOR offices in all the counties and 30 international offices.

INVANOR spent NOK9.8bn on business support and NOK235m on advice services in 2009. The agency provides a range of services to individual companies to build competence and networks.

INVANOR's tasks are

- Enhancing innovation in enterprises and industry
- Building competitive Norwegian enterprises at both domestic and international markets
- Promoting Norwegian enterprises
- Promoting Norway as a tourist destination
- Securing development in rural areas
- Transforming ideas into successful businesses
- Promoting interaction between enterprises, knowledge communities and R&D institutions

6.1.2 INVANOR/SIVA/RCN collaborative schemes

There are two dedicated joint programmes that involve all three agencies. These are both cluster programmes

1. The Norwegian Centres of Expertise (NCE). This scheme aims to enhance innovation in the most expansive and internationally oriented industrial clusters in Norway. Companies get a better basis for implementing and carrying out intensive innovation processes, based on cooperation with relevant business partners and knowledge of participants. It provides better conditions for new businesses, through the commercialisation of new business ideas and the location of external entities in the cluster⁴⁴
2. The Arena programme, which is a national programme for long-term development of regional business clusters. The programme offers both advisory and financial support. The objective is to strengthen the clusters innovative ability through a

⁴¹ www.siva.no

⁴² NIBR/Oxford Research A.S *Infrastruktur gjør forskjell – Evaluering av SIVA 2002-2008*, 2010

⁴³ [www.siva.no/internett/cms.nsf/\\$all/dcbb6b660c1cdc3fc125745f0040ab50?open](http://www.siva.no/internett/cms.nsf/$all/dcbb6b660c1cdc3fc125745f0040ab50?open)

⁴⁴ http://ekstranett.innovasjon norge.no/templates/Page_Meta_____56195.aspx

stronger and more dynamic interaction between the industry, R&D institutions, universities and the public sector. The interaction is to be long-term, goal-oriented and focused on innovative collaboration, international awareness, access to knowledge and new business⁴⁵.

In addition, INVANOR and RCN cooperate administratively on the SkatteFUNN⁴⁶ programme, the fiscal instrument offering tax relief for R&D performing companies in Norway. This cooperation does not incorporate any strategic elements. INVANOR receives the proposals and sends them to the SkatteFUNN group in RCN to assess whether they satisfy the Frascati criteria for R&D. RCN returns the proposals with a straightforward *yes* or *no*.

Innovation Norway administers the NCE programme, which is managed on a daily basis by a programme secretariat led by a programme manager. The programme is co-steered by RCN through its regional offices as well as by SIVA. The Arena programme is under the auspices of the same programme manager – and there is a joint programme council for NCE and Arena.

The programme council's task is to develop the two programmes' objectives and strategies, establish procedures for new projects and prioritise projects to be funded.

The programme council includes individuals from INVANOR, SIVA, RCN, TTO Nord AS, Statoil, the Norwegian Institute for Urban and Regional Research, the Norwegian Association of Local and Regional Authorities, and an unnamed company representative.

6.1.3 Comparison of the agencies' activities

Comparison of the actual instruments, excluding the joint undertaking of the three agencies led to the observation that there is little distinguishing the target groups of the three agencies whom all encompass HEIs and industry alike. Support for public organisations is strong on a regional level as specifically all three are keen to emphasise partnerships in the Norwegian regions. Therefore, overall, it is the nature and the stage of (maturity of) the funded project that is decisive in determining the funder or specific programme mechanism.

INVANOR encourages dialogue with innovators and businesses, as a way of making them aware of other agency instruments to support them. INVANOR appears to have the more consultative role, but the cooperation agreement clarifies that any advice should direct potential clients to the most appropriate of the three agencies. INVANOR's instruments are typically geared towards commercialisation, project and operational funding, and advice.

We constructed Table 27 by comparing lists of the three organisations' instruments and programmes and looking for areas where two of them might overlap. As is clear from looking at the table, the majority of RCN's activity is so different from what the other two do that it is not worth listing.

SIVA, the agency solely dedicated to supporting physical and organisational infrastructure, runs four different incubator programmes (*FoU-inkubator*, *Distribuerte inkubatorer*, *Industri-inkubator* and *Mat- og natur-inkubator*). These cater for industry in Norway, as well as leading and regional HEIs. SIVA also supports business or science parks (including HEIs) through an additional three instruments – *Næringshager*, *Forskningspark* and *Kunnskapspark*. Neither INVANOR nor RCN has equivalent schemes. The three agencies support clusters through the common NCE and Arena schemes, in which RCN's role is minor.

⁴⁵ www.arenaprogrammet.no

⁴⁶ For Skattefunn, Invanor receives the proposals and sends them to a special group in RCN to assess whether they satisfy the Frascati criteria for being R&D

SIVA and RCN are both concerned with internationalisation but SIVA's interest in the area is part of its infrastructural role while RCN's focus is on research funding and the mobility of human capital.

Both organisations have an interest in environment and primary industries, but their activities are clearly distinguished in that RCN operates research programmes that input to innovation while INVANOR funds later stages of the innovation process.

One potential area of overlap is between INVANOR loans to support innovation and RCN's user-directed R&D grants. In principle, there is also here a reasonably clear distinction in terms of the amount of research involved – RCN essentially subsidises companies to spend money on R&D at the institutes while INVANOR funds companies' own activities. There are borderline cases where a potential INVANOR beneficiary needs to go outside to the institute sector or where an RCN applicant has a project that involves little real R&D.

There is evidence of collaboration between RCN and INVANOR beyond the joint programmes and our interviews suggest there is a good deal of contact at the operating level, especially between INVANOR and the Innovation Division. INVANOR representatives are involved as observers in the board of RCN's maritime programme and RCN staff is member of the maritime credit committee. INVANOR has insight in the applications to RCN; RCN has passed some proposals over to INVANOR; and some projects are even co-funded. INVANOR also supports RCN in the development and implementation of the new FORNY2020 programme, focused on potential start-ups, and a representative of INVANOR is member of the RCN cross-divisional working group for the Northern areas (Nordområdene, a portfolio analysis group). Another example is the RCN/INVANOR cooperation on Eurostars.

Table 27 SIVA/INVANOR/RCN – potentially overlapping areas of activity

Support	SIVA	INVANOR	RCN
Incubator/ Cluster	<ul style="list-style-type: none"> • R&D incubators • ‘Distribuerte’ incubators • Industry incubators • ‘Food and nature’ incubators • Business Parks • Research and knowledge parks • Science Parks • NCE/Arena 	<ul style="list-style-type: none"> • NCE/Arena 	<ul style="list-style-type: none"> • NCE/Arena
Internationalisation	<ul style="list-style-type: none"> • Cooperation with the Barents region, including northwestern Russia • Ad hoc 		<ul style="list-style-type: none"> • Researcher Mobility • European cooperation • Project establishment support (European R&D programmes)
Tourism	<ul style="list-style-type: none"> • <i>Reisemålsutvikling</i> 	<ul style="list-style-type: none"> • <i>Reisemålsutvikling</i> 	
Gender	<ul style="list-style-type: none"> • <i>Kvinnovasjon</i> 	<ul style="list-style-type: none"> • Management/Leadership course for women 	
Environment and primary industries		<ul style="list-style-type: none"> • Eco-innovation • Support for wood innovation, fishing boats, agriculture • Bioenergy support 	<ul style="list-style-type: none"> • Climate Change and Impacts in Norway • Optimal Management of Petroleum Resources • Clean Energy for the Future – Research to generate clean energy systems for the future • Biotechnology for Innovation- • AQUACULTURE
Other investment support	<ul style="list-style-type: none"> • Investeringselskap • SIVA Real Estate Holding (SEH) 	Business Network <u>Loans</u> <ul style="list-style-type: none"> • Innovation • Low risk • Guarantee <u>Grants</u> <ul style="list-style-type: none"> • Projects • Establishment (start up) • R&D • Kraftintensiv industri • OFU/IFU 	<ul style="list-style-type: none"> • User-directed innovation programmes

6.2 The cooperation agreement

6.2.1 Background

Official documentation states that cooperation between RCN and Innovation Norway has been formalised since 1996 (originally between RCN and SND). The first cooperation agreement between all three agencies came into effect a year after the establishment of Innovation Norway – in 2005.

When Innovation Norway was established, in 2004, the remit of SIVA was left out (it stayed with SIVA), but SIVA would be the subject of a review to set its future direction. The Ministry of Trade and Industry subsequently published *St.meld. nr. 46 (2003-2004)*. This report concluded that SIVA should continue to be an independent agency with responsibility for owning and facilitating innovation networks^{47 48}.

⁴⁷ NIBR/Oxford Research A.S *Infrastruktur gjør forskjell – Evaluering av SIVA 2002-2008*, 2010

The aim of the Cooperation Agreement was to support the development of three distinct and coordinated agencies, whose instruments support each other and provide holistic support for users (defined as industry, R&D institutions and public authorities) across the country. A main focus was to ensure coordination of operations in activities with high risk of overlapping of the three organisations.

The agreement was renewed in 2007 with the addition of specific cooperation areas – a common knowledgebase, a holistic client perspective and stronger regional coordination.

As a result of a 2010 government reform (*Forvaltningsreformen*⁴⁹) affecting the administration of the counties in Norway, the regions received increased responsibility for industrial development. This in turn required effective coordination that not only included the three national agencies, but also regional development actors.

6.2.2 The current cooperation agreement

The current SIVA/RCN/INVANOR agreement covers the 2009-2013 period. Its underlying aim is to facilitate the agencies to support activities complementing the value chain from idea to product. Although the individual agency roles are clear and distinct, the end result should be to provide holistic support to users (industry, R&D institutions and public authorities) and add value to the national research and innovation system.

Three overall areas are prioritised. In addition and if deemed necessary, supplementary agreements can be developed for specific themes or sectors.

1. A common knowledge base as a prerequisite to creating a common understanding of innovation and innovation challenges – regional as well as international – faced by Norwegian industry. The knowledge base should support the agencies in their development of relevant, holistic and client friendly portfolios
Goal: the three agencies should individually and collectively produce a knowledge base relevant to industry and useful for policy development and implementation
2. A holistic client perspective that clearly communicate the different roles and skills of SIVA, RCN and INVANOR. Secondly, the agencies should enforce good cooperation vis-à-vis (physical) infrastructure
Goals: (1) clients should experience SIVA's, RCN's, and INVANOR's services as relevant and user-friendly, whether regionally, nationally or internationally. (2) The three agencies should collectively offer infrastructure that users find relevant and effective.
3. A stronger regional coordination. On a regional level the agencies should cooperate effectively and flexibly with county councils and regional development actors. SIVA, RCN and INVANOR should simultaneously develop their own regional instruments that should coordinate well on an aggregate level
Goal: the three agencies should contribute to an effective and flexible cooperation with regional actors towards the need of industry.

The agency cooperation agreement does not require the agencies to cooperate in any specific thematic or described policy areas. For example there are no explicit or detailed instructions for collaboration within e.g. energy or climate change. Rather the agreement implies the agencies' cooperation should facilitate a well functioning system overall and is written in general terms.

There is however the emphasis on regional cooperation stating that *on a regional level the agencies should cooperate effectively and flexibly with county councils and regional development actors. SIVA, RCN and INVANOR should simultaneously*

⁴⁸ Our translation

⁴⁹ www.regjeringen.no/nb/dep/krd/tema/fornyng-i-kommunene/forvaltningsreformen.html?id=540079

develop their own regional instruments that should coordinate well at an aggregate level.

Along with the overall arrangement, there is also a framework agreement (dating from 2011) that specifically covers the area of regional coordination.⁵⁰ This puts in writing the three agencies' remit on a regional level. It also requires regional agency cooperation to i) Take the form (division of labour) most suitable to the individual region, ii) Be a strategic partner for the regional authorities in research and development, innovation, and industrial development, iii) Have defined and clear roles and ensure the specific competences of the agencies are fully utilised.

The concrete responsibilities of each agency are outlined in Table 28.

Table 28 Regional cooperation division of labour

Area of cooperation	Activities	SIVA	RCN	INVANOR
Knowledge and understanding of the respective agencies and services	<ul style="list-style-type: none"> • Ensure staff are informed of the agency division of labour • Annual meetings of the agencies' regional managers • Invite regional development actors to events, courses, conferences etc organised 	<ul style="list-style-type: none"> • Include RCN and INVANOR in its regional innovation networks and invite RCN and INVANOR to regional innovation meetings • Contribute to the development of regional meeting places • Encourage regional innovation infrastructure sharing with RCN and INVANOR clients 	<ul style="list-style-type: none"> • Take the initiative to organise meetings between RCN programme staff and SIVA and INVANOR regional representatives • Participate in relevant district meetings and share RCN resources for information and dialogue 	<ul style="list-style-type: none"> • Should facilitate for regional development actors to participate in relevant regional meetings
Area of cooperation	Activities			
Holistic services portfolio with a coordinating function	<p>The agencies should</p> <ul style="list-style-type: none"> • Proactive activities towards clients should be coordinated in advance when possible. The agencies should involve each other if this would benefit (potential) clients, and inform clients of each others activities • Where possible SIVA, RCN and INVANOR representatives should participate collectively at marketing events. The agencies should underline common activities such as ARENA and NCE • Seek advice from each other • The agencies should keep each other informed of relevant developments 			
Area of cooperation	Activities			
Regional strategic processes	<p>The agencies should</p> <ul style="list-style-type: none"> • Coordinate annual action plans and strategic planning processes of the county councils • Cooperate to mobilise regional actors in national programmes that are relevant to the area • Underline regional innovation policy questions, through eg media and by participating in events • Coordinate input to, and implementation of, regional strategies eg VRI projects or the regional research funds 			
Common profiling on the regional arena	<p>The agencies should</p> <ul style="list-style-type: none"> • Clarify their cooperation on their respective websites and on common innovation sites online • Make the cooperation and the results stemming from common activities visible in the media and at events • Publish common press releases, and organise common press conferences and meetings when appropriate 			

Regional cooperation takes place through the Arena programme and NCE. In addition, the Regional Research Funds and RCN's newly established *Virkemidler for regional FoU og innovasjon (VRI)* are two more prominent regional RD&I interventions⁵¹. These are capacity-building in character. VRI aims to strengthen the institutions and

⁵⁰ Rammeavtal mellom Innovasjon Norge, Norges forskningsråd og SIVA om samarbeid på regionalt nivå

⁵¹ Forskningsrådet Utredning om opprettelse av regionale forskningsfond Utredning bestilt av Kommunal- og regionaldepartementet og Kunnskapsdepartementet

strategic capacities for innovation and development in the regions, building on a long tradition of regional self-organisation and workplace innovation. It is organised by County, so it matches directly regional governance and the regional structure of Innovation Norway. The regional research funds are organised at the level of more aggregated regions. The little experience with them so far suggests there is learning about the further development of regional research and innovation capacities, though our interviews with research performers suggest dissatisfaction with the extreme innovation focus in some areas, notably the West. At this stage, however, it is too soon to make a serious judgement of the effects of this new instrument.

6.2.3 Cooperation agreement organisation

The implementation of the Cooperation Agreement means the agencies have set up a Coordination Committee and Working Group, which meet regularly and also involve the regular attendance of the administrative directors.

The directors general of the three agencies meet annually and there is a quarterly meeting among the agencies at the operational level (working group).

Along with the actual agreements, we have also received minutes from the Coordination Committee meetings between 2008-2010. Above all, the discussions documented in the minutes revolve more around national – in particular regional issues, rather than international ones. The minutes cover eg

- The high level content of the renewed cooperation agreement (2009), including prioritised areas – Bioprospecting, Health and innovation, Environment and energy, the Northern regions, the Service sector and Commercialisation
- Regular discussions around thematic cooperation. Areas of ongoing collaboration include clusters and networks, the maritime sector, gender and young people, entrepreneurship, culture, tourism and strategy. Areas of low levels of cooperation include transport and logistics, building/construction and ICT. There is ad-hoc collaboration in biotechnology, and nano- and materials technology. In areas of political importance, such as climate/environment, renewable energy, and oil and gas, there are also low levels of collaboration
- Particular responsibilities and remits within thematic areas Bioprospecting, Health and innovation, Environment and energy, the Northern regions, the Service sector and Commercialisation
- Interagency input into particular programmes (eg RCN's FORNY).

6.3 Feedback on the interagency cooperation

6.3.1 Implementation of the Cooperation Agreement

From what can be judged from the documentation available, there are regular activities around the inter-agency cooperation, and as such, goodwill towards a coordinated national research and innovation system.

The minutes of a Coordination meeting in December 2010 suggests that the concrete content of the cooperation is dependent on the roles each institution has, and although the [2009] Cooperation Agreement describes these roles they should be further clarified. With the exceptions of Arena and NCE, the cooperation appears to be geared toward agency liaison in specific areas, with weight put on regional cooperation, and consultations on possible future areas of interest.

As a construct, it would be difficult to judge the success of the Cooperation Agreement, as the objectives and goals are not easily measurable. Nor are there specific indicators or agreements about what the agencies will do should the goals not be fulfilled.

There also appears to be a lack of analysis across the clients or users of the agencies. This seems to be the main gap in the cooperation. Closing it would enable each of the agencies – but especially RCN and Innovation Norway – to target their instruments and distribution channels better.

6.3.2 Evaluations

Recent evaluations of SIVA and Innovation Norway have both looked at the relationship between the two agencies and RCN⁵². The findings of the INVANOR study⁵³, partly been derived through interviews with R&D stakeholders in Norway, suggest the cooperation agreement facilitates good coordination between INVANOR and RCN. There were no indications that there are issues in the interface between the agencies that would require any changes in the division of labour.

To a large extent the case is the same for the relationship between Innovation Norway and SIVA. This is because actors understand the division of labour where SIVA's focus is on the development of infrastructure for innovation and industrial development, while INVANOR works with single businesses. But SIVA also supports activities for incubators and business networks. In these areas there is more opportunity for cooperation. This cooperation takes place through eg the Arena and Norwegian Centre of Expertise programmes, areas which are subject to the agencies' cooperation agreement. But evaluation feedback from INVANOR also suggests that SIVA is involved in projects within the remit of the Innovation agency. The 2010 SIVA evaluation undertaken by NIBR and Oxford Research gives *Kvinnovasjonsatsingen* as an example of overlapping activities.

At a regional level, there is less cooperation between INVANOR and SIVA, largely because SIVA does not have an extensive regional representation. Interaction tends to occur when both agencies participate in regional innovation networks⁵⁴. The INVANOR evaluation also suggest that SIVA and RCN also make use of Innovation Norway's regional offices to disseminate information on their services.

None of the reports mentions any similar issues in the division of labour involving the Research Council.

6.3.3 Input from the Association of Innovation Societies in Norway (FIN)⁵⁵

With the recent evaluations of SIVA and Innovation Norway, FIN (the Association of Innovation Societies in Norway) has volunteered input to the Ministry of Trade and Industry.

Both pieces of input from FIN, which represents the 20 largest innovation companies in Norway⁵⁶, address the balance and cooperation between SIVA, RCN and INVANOR, largely from the point of view of incubators.

In its comments, which were published as a follow up of the SIVA evaluation in 2010, FIN suggests the Ministry should evaluate whether the means/instruments available to support innovation today are optimally divided to facilitate the development of new growth companies. As an example, FIN highlights resource related issues for applicants seeking funding for (physical) incubators from SIVA and incubator stipends (for operational support), which are applied for through Innovation Norway⁵⁷.

In a more recent document referring to the evaluation of Innovation Norway (2011), FIN again underlines that research and innovation agency cooperation – in particularly on a regional level – can be improved. FIN comments that SIVA, RCN and INVANOR, together with regional development actors, should consider providing

⁵² The NCE and Arena programmes have also been evaluated, however these studies have not included agency management aspects, but focused on the progression of the actual projects

⁵³ Econ Pöyry Evaluering av Innovasjon Norge, Utarbeidet for Nærings- og handelsdepartementet, 2010

⁵⁴ Econ Pöyry Evaluering av Innovasjon Norge, Utarbeidet for Nærings- og handelsdepartementet, 2010

⁵⁵ Our translation – the original name of the association is *Foreningen for innovasjonsselskaper i Norge*

⁵⁶ <http://fin.abelia.no/om-fin/medlemmer>

⁵⁷ FIN Evaluering av SIVA – høringsuttalelse, 15.11.2010

particular support to networks currently too underdeveloped to receive funding through the ARENA programme.

More generally, FIN appears to point to the **‘Valley of Death’⁵⁸ failure**, where growth in innovation is dependent on a functioning value chain – from idea to commercialisation. FIN says that “Innovation companies/incubators are in practice also actors for newly established growth companies, but often end up in a ‘vacuum’ between Innovation Norway and RCN instruments and are poorly financed”.^{59 60}

This statement appears to be supported by RCN’s study on the establishment of the regional research funds which says “*VRI, NCE and Arena focus on regional cooperation and mobilisation, but none of the programmes have the funds to finance R&D projects beyond small pre-project funding*”⁶¹

6.3.4 Feedback from stakeholders

As part of this RCN evaluation, we have compiled a **company survey report**, whose accompanying questionnaire has also helped us look into the SIVA/RCN/INVANOR company clients’ view of the three agencies. The overall purpose of the company survey was to collect opinions about RCN, its instruments and performance, alternative support options and future needs. The survey addressed companies that had received funding from RCN between 2000 and 2010. A total of 100 companies were interviewed. The interviews were conducted with individuals who had an overarching position in R&D.

In summary, the company survey concluded that

- Compared with INVANOR, respondents on average found RCN more relevant. However, also Innovation Norway receive high scores on relevance; the higher number of low scores on Innovation Norway probably relate to the Innovation Norway’s regulations of its funding schemes, which sometimes prioritise smaller companies and thereby discourage larger companies from applying
- Only a small number of respondents find SIVA relevant as a source of funding. Most respondents that give high scores on SIVA specialise in developing advanced technologies, either for their own business or for subsequent commercialisation elsewhere. A large number of respondents did not know of SIVA.

Similarly, NIFU – also as part of this RCN evaluation – has conducted and compiled a survey that was designed for researchers, research institution leaders and participants in RCN meeting places (Background report WP5a).

There is little spontaneous mention of the agency cooperation; rather Innovation Norway and/or SIVA are mentioned in their roles as funders. The survey indicates that these roles have remained largely unchanged 2005-2010, with 85.5% of respondents signalling the same levels of INVANOR/SIVA support throughout the five-year period. Recipients of RCN funding do not appear rely much on the other two agencies.

Our interviews with Innovation Norway, SIVA, industry, industry associations and research-performing institutions suggest general satisfaction with the division of labour. There is little sense that beneficiaries are confused about which agency to go to for which kind of support. Nor is it reasonable to expect that all potential

⁵⁸ A term is used to signify the dangerous nature of the gap that exists between a typical startup’s financial requirements (necessary to cover negative cash flow in their early years) and the funds young and unproven enterprises can secure from the formal venture capital market, which on average prefers to make larger equity investments in less risky undertakings

⁵⁹ FIN Evaluering av Innovasjon Norge – høringsuttalelse, 1.2.2011

⁶⁰ Our translation

⁶¹ Forskningsrådet Utredning om opprettelse av regionale forskningsfond Utredning bestilt av Kommunal- og regionaldepartementet og Kunnskapsdepartementet

beneficiaries will maintain a clear understanding of the agencies and the support opportunities they provide. It is at the stage of search that transparency matters, so that beneficiaries can find what they are looking for. In this respect, our view is that the Innovation Norway web site is unhelpful, owing to the organisation's desire to bring companies into a personal dialogue before informing them of the opportunities on offer.

Several interviewees pointed out that the regional mission of Innovation Norway means there is the biggest gap in innovation (as opposed to research) support for industry in the capital region, which is where the highest concentration of innovative firms is. That seems unfortunate to us, but it is a matter of policy and formally beyond the scope of this evaluation.

From the beneficiary perspective, of course, the degree of cooperation among the agencies does not matter, as long as there is a useful range of support measures on offer. At the working level of national programme officers and in the regional offices, relations between Innovation Norway and RCN are said to work well. The gap in cooperation is outside Norway, where Innovation Norway maintains a large and expensive network of offices associated with the embassies that could be better connected to RCN's strategic intelligence functions of searching out information about policy and potential cooperation partners.

Innovation Norway and a number of others pointed to the 'Valley of Death' syndrome in Norway: namely, that there is a lack of early-stage funding and seed-corn money for investment in commercialising inventions. Innovation Norway felt RCN should be doing more in this area. Others argued that the deficiency is partly with the venture capital market (which is always reluctant to take early-stage risks, and which has become even more cautious since the start of the financial crisis) and with the existing state seed-corn funding arrangements that are unable to meet the needs. In so far as this may be true, the problem should be tackled through these mechanisms. RCN has neither the mission nor the skills to deal with early-stage venture capital investment.

The substantive lack emerging from the interviews is of substantial shared analysis among the three agencies – and especially between Innovation Norway and RCN – of their customers and the innovation process more widely. They are missing the opportunity to segment and understand their overall customer base through better use of existing data. They are also missing the opportunity more closely to study specifically Norwegian types of innovation process, their spatial and sector dimensions in order to provide feedback to instrument design and policy.

6.4 Key findings

This chapter's findings suggest that RCN boundaries with SIVA are overall clear and well understood. Those with INVANOR, where there are more overlapping areas of interest, are sometimes more vague. While this does not seem to cause significant problems for beneficiaries, it reinforces the already well-recognised need for collaboration.

Collaboration with SIVA appears mostly to take place within the framework of the cooperation agreement, and the SIVA evaluation did not raise any immediate alarm bells regarding interagency cooperation either. The cooperation between RCN and INVANOR largely runs smoothly, but seems to be of a variable nature and not always to be systematic. However, it is hard to identify negative consequences of this at the operational level.

Outside the commonly prioritised areas (Bioprospecting, Health and Innovation, Environment and Energy, the Northern regions, the Service sector, and Commercialisation) it is regional cooperation (the third cooperation agreement point) that is the most prominent and well functioning, both according to the literature as well as our consultations. While the interface RCN/INVANOR works well in the regional offices, there are lower levels of activity in the international equivalents.

There is increasing collaboration also in areas such as maritime, energy and environment, and innovation/commercialisation (eg. the FORNY2020 programme). The most acute interface between RCN and INVANOR is in the area of innovation, and these possible parallel activities were examined by the INVANOR evaluation⁶², which concluded it could not foresee or describe any problems in cooperation. There is said to be close collaboration – or at least regular communication – between individual members of staff or teams across the three agencies also in other areas, but these ad-hoc activities are not documented.

It is difficult to judge whether increased collaboration in areas such as transport and logistics, building/construction, ICT, climate/environment, renewable energy and oil and gas would be beneficial as the current cooperation agreement still calls for the three agency roles to be further clarified. Indeed, the minutes from the coordination meetings indicate the agencies are not today clear how to best proceed with closer working practices in areas where there is today little interagency activity. A recent development is the launch of the idea of common strategic efforts, eg. in areas of bio- and nanotechnologies.

Critique from interviewees and other Norwegian actors (notably FIN, the Association of Technology Transfer Companies in Norway) seems to suggest failures are found on a systems level, indicating there are gaps in the seed-corn funding aimed at supporting commercialisation of research or innovations, which is hindering the expansion of Norwegian growth companies.

Overall, there is little use of common strategic intelligence nor do RCN, INVANOR nor SIVA seem to have a systematic way to share such intelligence. We are not aware of any analyses made of SIVA/INVANOR/RCN clients or users, such as plans or studies covering the research institutes. This would suggest that there are possible weaknesses within the first two points of the cooperation agreement (1) a common knowledgebase and (2) a holistic client perspective.

Based on this analysis, we suggest that

- The three agencies explore the opportunities for improved use of customer and other data to map, segment, explore and serve company beneficiaries (having due regard, of course, for the restrictions on re-use of data imposed by banking and data protection laws)
- RCN and Innovation Norway set up a joint working party to investigate the potential benefits of greater shared use of the international offices and attaché networks

⁶² Econ Pöyry Evaluering av Innovasjon Norge, Utarbeidet for Nærings- og handelsdepartementet, 2010

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