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Evaluation of the Research Council of Norway

Background Report No 4. The System of Management by Objectives

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Summary

This report describes and evaluates the Management by Objectives (*Mål- og resultatstyrning* – here abbreviated to MBO) system for RCN implemented in the steering and reporting process between the funding ministries and RCN in 2010-11.

The way in which the ministries steer RCN has been a subject of discussion for a long time. The new MBO system is an attempt to integrate ideas from the New Public Management into that relation, supporting the ministries in the exercise of their sector responsibility with respect to research while at the same time enabling coordination and a streamlined process of instruction and reporting. It also provides an opportunity to review the degree of specificity in ministry instructions and the dialogue with RCN about particular activities and therefore the room RCN has to manoeuvre in trying to optimise its activities at the national level while still making sure that sector needs are met.

The MBO system involves three high-level goals, broken down into a total of 13 sub-goals. The group that designed the system suggested a number of quantitative indicators that could be used in conjunction with it. In its reporting, RCN has carefully broken down its activities and budgets, allocating each to a unique sub-goal. This allows it to report and use some output indicators at the overall level but also to describe how money from individual ministries has been used and to some degree to connect that to sub-sets of outputs.

In 2011, most of the ministries adopted the system. It is largely overlaid on previous practice, with letters of allocation providing an indication of which MBO sub-goals ministries want RCN to pursue on their behalf in addition to a traditional set of tasks and guidelines. Ministries vary in the extent to which they specify what performance indicators RCN should use; in any case, they do not tend to set target values. Goals are therefore high level and not quantified. NHD has partially overlaid the system on its own one and asks for reporting following its own budget lines. Ministries take on sub-sets of the 13 goals according to their own needs.

Our discussions with 11 of the ministries suggested that while two felt the new system improved the steering and reporting process, the remainder felt it added length but little value to the process. In the absence of specific targets or significant variations from plan, RCN judges that its performance against all 13 goals is “satisfactory”. The complexity of RCN’s steering relationships with 16 ministries makes it a unique case, but it is noteworthy that foreign systems tend to be simpler, more aggregated in their reporting and use a small number of indicators. Some countries emphasise assessments of impacts more than RCN and other Nordic agencies do.

The new MBO system clearly offers an opportunity for a process of improvement in the quality, clarity and specificity of steering and reporting while enabling better coordination among ministries and giving RCN opportunities to serve their needs using common programmes and other instruments as far as possible. So far, the new MBO system has changed the form but little affected the content of the steering relationships. The ministries need greater incentives to adopt it. At the moment it is probably more useful to RCN and to KD than to the other ministries. The ministries should now collectively review their experience together with RCN and move towards a steering RCN through more general high-level goals, set more specific performance expectations and implement a shorter and more transparent reporting system.

1. Introduction

This report describes and evaluates the Management by Objectives (*Mål- og resultatstyrning* – here abbreviated to MBO) system for RCN implemented in the steering and reporting process between the funding ministries and RCN in 2010-11.

The 2001 evaluation identified a number of issues in the steering relationship between the ministries and RCN that related to the sector principle. It said that the meaning of the sector principle in relation to research was not clear and that many ministries did not differentiate between securing the long- and short-term aspects of their own knowledge needs or those of their sector. As a result it is not clear who is responsible for ensuring the existence of research capacity needed by the sector. That the ministries often steer RCN through many detailed instructions reflected a certain distrust of the Council but also the fact that the real steering took place at the operational level rather than at the level of strategy and with little or no reference to the Division or Executive Boards of RCN. Small ministries particularly felt their needs could easily become marginalised.

In 2004, supported by an inter-departmental reference group, KD's predecessor ministry produced a document that reflected on the meaning of the sector principle for research¹. It concluded that this responsibility comprised

- Overall responsibility for research for the sector
- Responsibility for maintaining an overview of the sectors knowledge needs
- Responsibility to finance research for the sector
- Responsibility for international research cooperation

Specifically this means, according to that report, that the ministries are responsible not only for ensuring the availability of resources directly to fund research but also for ensuring that there is research capacity to do that research. The report laid down different sets of principles for the 'narrow' sector responsibility to secure the ministry's own knowledge needs for making policy and the 'broad', capacity-related responsibility. The narrow case involves

- Defining the ministry's knowledge needs and ensuring that policy is based on up to date knowledge
- Setting research goals and priorities and communicating these to RCN
- Ministries can participate in designing the instruments and programmes to be used
- Ministries must ensure resources are set aside to maintain the capacity needed to supply their knowledge needs and to comply with Norway's international responsibilities
- Where the ministry is itself a user of the knowledge to be produced, it may sit on the relevant Programme Board but should refrain from taking positions on which particular applications should be funded

The broad sector responsibility involves

- Maintaining an overview of knowledge needs within the sectors for which it has responsibility
- Prioritise among these and communicate the priorities to RCN and research-performing organisations through White Papers, the state budget and letters of allocation, as well as directly to RCN and the research performers

¹ *Departementenes sektorsansvar for forskning, Sluttrapport fra et arbeid utført av Utdannings- og Forskningsdepartementet, Oslo: UFD, 2004*

- Ministries should define overall objectives for research and establish reporting requirements but largely not involve themselves in implementation at the level of individual programmes or projects
- The ministries should establish the required balance between applied or user-directed- and long-term research
- By and large, the ministries should not participate in Programme Boards
- Ministries should view their research needs in relation to those of other ministries

In the follow-up to its self-evaluation of 2006, RCN pointed out to KD that many of the steering issues raised in the 2001 evaluation were still relevant and launched the idea of using the fact that MBO was now considered a key principle in government to try to address some of these problems². RCN noted that. “It is a challenge to combine the ideal associated with MBO that the choice of instruments should be left free [to the agent] and the political way of working, which is largely activity orientated.” It said that it had observed a number of problems in the letters of allocation for 2008

- It is a systemic challenge to deal with 16 letters of allocation at once. Methods, goal structures and reporting parameters should be as similar as possible across these
- Even though MBO has been established as a principle, many letters of allocation lack goal statements, targets or performance indicators
- Such goals as are stated are often vague, lacking any ambition level or time dimension
- There is a need to distinguish between goals on the one hand and specific tasks and instructions on the other. Not all the guidelines (*føring*) in the letters of allocation fit naturally into an MBO system
- Goals and tasks need to be realistic and relevant to RCN’s activities

It was agreed that KD could use its role as RCN’s ‘owner’ to increase the coordination of letters of instruction by adopting a common MBO system.

Such a system was therefore developed and reported in, *Mål- og resultatstyring av Forskningsrådet: god styringsskikk*, in 2009 and subsequently developed in *Forslag til implementering av MRS-systemet i Forskningsrådet*, which was subsequently produced by the RCN and provides further details of the MBO framework; how the allocation letters, RCN budget proposals and annual reports will be used to account for MBO goal realisation. This document also refines the overall goals as articulated in the first report, and provides preliminary indicators for how to measure MBO goal progression.

It was decided to start implementing the MBO system in 2010 and that it should be fully implemented in 2011. Our analysis focuses on 2011, since this is the first point at which the system is supposed fully to be in place. This is rather early for such an evaluation since those involved have really only one year’s experience, so that is naturally a limitation of our report.

² Letter from Arvid Hallén and Svein Erik Høst to KD dated 16.05.2008

2. The MBO system in RCN

2.1 Objective

The Management by Objectives (MBO) system was developed by the RCN and nine of the Norwegian ministries with the basic rationale of increasing the added value of the work of the RCN under the sector principle.

The MBO system should make reporting and communication between the RCN and ministries more streamlined and comparable as it will use a common goal structure and indicators, and common requirements for reporting. The main means used for communication are the allocation letters, which should also be used in a structured manner by the ministries when requesting strategic and advisory services from the RCN. As not all MBO goals and sub-goals would be equally relevant to all ministries, the individual ministries can elaborate in less or more detail on each point, thus focusing on their priorities while maintaining the standard format. Ministry objectives and goals vis-à-vis RCN programmes and activities can also be shown through indicators.

The MBO system will furthermore shape the structures and procedures of agency management meetings involving RCN and the ministries. From RCN's side, the MBO reporting will be used to demonstrate how its programmes and activities are contributing to the follow up of the MBO goals.

2.2 MBO development process

According to public regulation in Norway³, if an organisation is receiving allocations from more than one ministry, the ministry with the administrative responsibility should lead the management coordination – in this case, KD. The MBO system development predominantly took place in 2008-09 through a series of meetings chaired by KD and with the RCN, NHD, HOD, FKD, LMD, MD, SD, OED and AID present.

The working group put together for this exercise was asked to map the current management procedures in place between RCN and the ministries, and put forward concrete suggestions, advice on, and conclusions for how to improve coordination of the Research Council. The design and development of the MBO system took into account already existing procedures, namely the RCN statutes and strategy, the ministry allocation letters, and (unspecified) evaluation reports addressing additionality. The design and development also took into account the structure and characteristics of the sector principle.

The time frame (as presented in 2009) was to have the working group's conclusions taken up in the management programme in 2010⁴.

2.3 Goals and indicators [Styringsparametere]

The MBO system shall work alongside the other RCN governing principles and systems, namely i) Government White Papers – currently *Klima for forskning* – and that predominately entails temporary, or administration specific, goals. ii) Ministry specific objectives, which vary in content and also in the level of detail to which they are developed. iii) The RCN strategy.

³ Bestemmelser for økonomistyring i staten kap 1.4

⁴ Arbeidet skal være ferdig slik at resultatene kan tas inn i styringsopplegget for 2010.

The MBO system implementation document produced by RCN⁵ envisages MBO will complement the abovementioned existing measures in place and be “relatively broad, stable and unchanging, but at the same time also take into account specific goals set by the Ministries through their allocations to the RCN”⁶.

The MBO system consists of three overarching goals (outlined below in Figure 1) that RCN shall work towards. The main goals have been articulated to be broad enough to encompass all ministries, with the sub-goals being more applicable to some ministries than others, depending on their policy remit. The ministries should therefore elaborate and conceptualise the sub-goals to RCN, using the ones they deem are relevant to their area of responsibility. In this respect, the MBO should function as both the overarching management as well as reporting system.

Figure 1 MBO system overall goals

1. Nation-wide increased quality, capacity and relevance in research
 - Strengthened research in nationally prioritised areas
 - Increased breadth of long-term basic research and a focus of resources around the best research
 - Increased breadth of research-based innovation and a focus of resources around the best research and innovation environments
 - More research in industry, both in terms of quality and quantity
 - Strengthened research in alignment with the knowledge needs of the (industry) sectors and public administration
2. Effective use of resources and division of labour, collaboration and structure in the research system
 - Better conditions for national research collaboration and strengthened international research collaboration⁷
 - Added value through effective use of research allocations
 - Dynamic and effective coordination and division of labour in the research system
 - A strategic responsibility for the Research Institute sector
3. Research results should be used by industry, society and public authorities and administration
 - Well adapted channels for dissemination of research to the public and well functioning places of learning set up between industry, institutes, the HEI sector, the Regional Health Authorities and public authorities and administration
 - Increased commercialisation of research results, and increased innovation in industry and in the public sector
 - Improved knowledgebase in the research strategic and advisory work [of the RCN]

Source: Translated from *Mål- og resultatstyring av Forskningsrådet: god styringsskikk*

⁵ *Forslag til implementering av MRS-systemet i Forskningsrådet*

⁶ *Forslag til implementering av MRS-systemet i Forskningsrådet*

Our translation

⁷ This sub-goal is later changed to “good coordination between national research activities and international research cooperation”

The three MBO goals have been the point of departure for the development of indicators, which should guide the RCN reporting back to the ministries on progress done under the MBO system. The indicators have been designed to be

- Simple
- Show the contributions of RCN in achieving the MBO goals
- Developed for each sub-goal
- Reported in electronic format, and predominantly based on existing data.

The indicators were, in 2009, still considered to be work in progress, but were to be tested and used for the 2010 allocation letters from the Ministries, with the RCN reportedly being keen on starting a dialogue on this as soon as possible, and to avoid adding further reporting on top of the work already being done for the presentation of the annual reports.

Figure 2 is adapted from *Forslag til implementering av MRS-systemet i Forskningsrådet* and shows how the RCN planned to apply the goals and sub-goals of the MBO system to its programmes and activities, along with preliminary indicators for measures goal attainment.

Figure 2 MBO Goals, sub-goals set against RCN areas of work and preliminary indicators

MBO Goals	Suggested scope	Examples of suggested indicators
1	Nation-wide increased quality, capacity and relevance in research	
1.1 Strengthened research in nationally prioritised areas	<i>This relates to the five strategic areas as outlined in Klima for forskning. RCN reports would encompass all programmes and activities that include one or more of these priority areas</i>	<ul style="list-style-type: none"> - Main activities (budget) falling under this goal - Grant types - Recruitment related activities (R&D man years, PhDs, postdocs) - Publications (e.g. number of peer-reviewed articles) - Innovation (e.g. new businesses, products, licences, services) - Funding per discipline, type of institution, type of research activity
1.2 Increased breadth of long-term basic research and a focus of resources around the best research	<i>The second sub-goal relates to activities such as independent project support, basic research programmes, support to young researchers (YFF) and centre programmes (SFF) and parts of the large-scale programmes. Other activities and programmes with quality related objectives would also be included</i>	<ul style="list-style-type: none"> - Main activities (budget) falling under this goal - Recruitment related activities (R&D man years, PhDs, postdocs) - Publications (e.g. number of peer-reviewed articles) - Funding per discipline, type of institution, type of research activity
1.3 Increased breadth of research-based innovation and a focus of resources around the best research and innovation environments	<i>This goal predominantly relates to BLA, the SFI and FME centres, VRI, and Industry PhDs. The reporting will also encompass all programmes and activities which relate to the goal Nationwide knowledge-based industry [kunnskapsbasert næringsliv i hele landet]</i>	<ul style="list-style-type: none"> - Main activities (budget) falling under this goal - Recruitment related activities (R&D man years, PhDs, postdocs) - Publications (e.g. number of peer-reviewed articles) - Innovation (e.g. new businesses, products, licences, services) - Type of institution and industry funded
1.4 More research in industry, both in terms of quality and quantity	<i>This sub-goal refers to activities directed at industry, that is BIP and KMB, as well as SkatteFUNN</i>	<ul style="list-style-type: none"> - Budgets of BIP and KMB - Recruitment related activities for BIP and KMB (R&D man years, PhDs, postdocs) - Innovation (e.g. new businesses, products, licences, services) vis-à-vis BIP and KMB - Type of institution and industry funded under BIP and KMB - Budget breakdown per sector of SkatteFUNN
1.5 Strengthened research in alignment with the knowledge needs of sectors and administration	<i>This, on the one side, refers to activities commissioned by individual ministries, and which will be reported individually. Reports will also include goals from the allocation letters, as well as an aggregate report on the contribution of all ministry allocations to public administration knowledge needs</i>	<ul style="list-style-type: none"> - Main activities (budget) falling under this goal - Recruitment related activities (R&D man years, PhDs, postdocs) - Funding per discipline, type of institution, type of research activity - Publications (e.g. number of peer-reviewed articles) - Innovation (e.g. new businesses, products, licences, services) - Internationalisation (budget) whether projects, in- and outwards mobility, hosting international activities, etc. - Relevant ministry specific activities - Budget breakdown per ministry

	1.6 Increased international cooperation and exchange ⁸	<i>This concerns goal-oriented activities relating to internationalisation, such as BILAT, programme supporting positioning, follow-up programme, EU activities (JPIs, ERA-Nets and so on), and other activities geared towards internationalisation</i>	<ul style="list-style-type: none"> - Internationalisation projects (budget), in- and outwards mobility, hosting international activities, etc
2	Effective use of resources and division of labour, collaboration and structure in the research system		
	2.1 Good coordination between national research activities and international research cooperation	<i>This includes thematic and technological activities of the European Framework Programme</i>	<ul style="list-style-type: none"> - Total budget breakdown according to European theme and technology area - Norwegian EU funding per theme and technology area
	2.2 Added value through effective use of research allocations	<i>This relates to RCN's coordination of resources within and between programmes</i>	<ul style="list-style-type: none"> - Cross-sectoral coordination: ministry programme co-financing - Average project budget per grant type
	2.3. Dynamic and effective coordination and division of labour in the research system	<i>This predominantly relates to the Centre programmes, research programmes, research infrastructure and networking activities</i>	<ul style="list-style-type: none"> - Centre programme initiatives per (host) institution type - Research infrastructure per institution type - Programmes per institution type - Core funding per institution type - Networking activities per institution type
	2.4 A strategic responsibility for the Research Institute sector	<i>This covers the Research Institutes receiving core funding from the state</i>	<ul style="list-style-type: none"> - Core funding per fixed sum, strategic and result-based funding - Scores using the five result indicators per institute group
3	Research results should be used by industry, society and public authorities and administration		
	3.1 Well adapted channels for dissemination of research to the public and well functioning places of learning set up between industry, institutes, the HEI sector, the Regional Health Authorities and the public authorities and administration	<i>This covers RCN's communication and dissemination activities, and any measures aimed at particular single groups</i>	<ul style="list-style-type: none"> - Goal-oriented communication, dissemination, user-contact per area of RCN activity - Total communication, dissemination, user-contact input per area of RCN activity - Total number of user- and general public directed dissemination activities, items published in the media, and events organised per area of RCN activity
	3.2 Increased commercialisation of research results, and increased innovation in industry and in the public sector	<i>This covers commercialisation programmes, most notably FORNY, but also other activities and programmes with elements of commercialisation</i>	<ul style="list-style-type: none"> - Goal-oriented commercialisation activities per area of RCN activity - Total commercialisation input per area of RCN activity - Total number of new businesses, licences, patents, products and services
	3.3 Improved knowledge base in the research strategic and advisory work [of RCN]	<i>Central tasks are RCN's financing of national R&D statistics, the commissioning of specific analyses and reports, establishing the FORFI programme, as well as internal analyses and evaluations</i>	<ul style="list-style-type: none"> - Total number of activities for improving the knowledgebase per discipline - Total number of activities for improving the knowledgebase per theme

⁸ This sub-goal is not mentioned in the 2009 document Mål- og resultatstyring av Forskningsrådet: god styringsskikk

We reviewed in detail the 2011 letters of allocation from the five case study ministries addressed in our report on Ministry Steering of RCN. As was intended, ministries adopted sub-sets of the goals relevant to their own activities (Figure 3). In its 2011 Annual Report, RCN followed its traditional practice of providing a collective annual report covering all its activities and then sixteen separate reports – one for each ministry. It addressed the sub-goals specified by the ministries in the ministry-specific report – usually by discussing the activities specifically funded by that ministry but occasionally by referring to the main annual report.

Figure 3 Ministries’ use of MBO goals in the 2011 letters of allocation to RCN

Goal	KD	NHD	OED	HOD	FKD
1.1 Strengthened research in nationally prioritised areas	X	X	X		X
1.2 Increased breadth of long-term basic research and a focus of resources around the best research	X	X			
1.3 Increased breadth of research-based innovation and a focus of resources around the best research and innovation environments	X	X+	X	X	
1.4 More research in industry, both in terms of quality and quantity		X+	X*		
1.5 Strengthened research in alignment with the knowledge needs of sectors and administration	X		X	X	X
1.6 Increased international cooperation and exchange ⁹	X	X+			X
2.1 Good coordination between national research activities and international research cooperation	X	X	X	X	X
2.2 Added value through effective use of research allocations	X			X	
2.3. Dynamic and effective coordination and division of labour in the research system	X		X	X	
2.4 A strategic responsibility for the Research Institute sector	X	X+			X
3.1 Well adapted channels for dissemination of research	X	X	X	X	
3.2 Increased commercialisation of research results, and increased innovation in industry and in the public sector	X	X		X	
3.3 Improved knowledge base in the research strategic and advisory work [of RCN]	X		X		

* Indicated in the allocation letter but not reported in RCN’s 2011 Annual Report to OED

+ Not indicated in the NHD allocation letter but reported by RCN in the 2011 Annual report

We obtained feedback from 11 ministries about their degree of satisfaction with the MBO system. It is important to note that half our interviews were carried out **before** RCN published its 2011 Annual Report, so interview partners’ reactions were often based only on the 2011 and 2011 letters and the 2010 annual report, as well as their regular dialogue meetings with RCN.

- KC was well disposed to the MBO system. It has become increasingly demanding of RCN in terms of reporting in recent years, and led the development of the MBO system partly in response to its need for better information
- NHD, on the other hand, saw the system as only partly useful. It cut across an MBO system NHD had been developing that matched its own budget lines. It did not contain indicators that were all that useful for steering and it missed out reporting in areas such as economic effects of funding in industry that NHD has in the past required. The letter of allocation in 2011 was therefore a compromise –

⁹ This sub-goal is not mentioned in the 2009 document Mål- og resultatstyring av Forskningsrådet: god styringsskikk

adapting as much as possible to the new system but still insisting that RCN provide the reporting that NHD additionally requires. In effect, NHD has overlaid the new system on its own previous one

- OED has adapted its letter of allocation to the new system but does not see that it adds any value. Such indicators as are provided are not very useful for steering. They count activities whose importance is not known – so they are useful in that they tell you ‘the patient is alive’ but it is not clear whether and how targets should be set for changing them
- HOD found the MBO system too unspecific. It needs to match research effort to the developing pattern of disease and health service priorities. It is starting to use the Health Research Classification in its communication with the Regional Health Authorities and with RCN, as this provides a level of detail that it finds meaningful
- FKD was agnostic. It had adapted its letter of allocation to the new system but found that the reporting that resulted was no better or worse than before. The ministry expected that more experience would allow it to develop a clearer view
- AD found indicators relevant to research in its field to be useful, but the majority of the system was not of interest
- JD was a very small research funder. It made little use of the MBO system or indeed any other research-related indicators
- KRD did not use the new system, which is nationally orientated. As the regional development ministry, KRD needs access to indicators at a more disaggregated level
- LMD made little use of the new system and had so far seen no effect on either its own behaviour or that of RCN
- MD uses the new system primarily to monitor capacity, quality and relevance in the system, focusing on the research institutes, internationalisation and global challenges. Much of the system was not relevant to MD, but using it had enabled it to become less detailed in its instructions to RCN so the ministry was happy to carry on using it
- SD saw the MBO system as over-complex and overly focused on things that can be measured. Not everything that can be measured matters; and not everything that matters can be measured

RCN observed in its 2011 annual report that the MBO system requires explicit judgements against each of 13 sub-goals, many of which overlap with White Paper priorities but are less time-bound. The MBO system does not specify what the criteria are for deciding whether goals have been reached, this there are a number of indicators but they have no target values. Judging success is therefore “demanding”. RCN has chosen to consider in each case changes in its performance compared with the previous year. In the absence of serious discrepancies or evident failures, RCN judges its performance to have been “satisfactory” against all goals. We are inclined to read this as a challenge to develop SMARTer¹⁰ goals in the future.

¹⁰ Specific, Measurable, Attainable, Realistic and Timely – the traditional criteria for judging the quality of goals

3. International practice

The following sections will provide an overview and brief descriptions of ministry steering and monitoring of public research funding (not including public spending on defence) allocated to research and innovation agencies in four countries – Finland, Sweden, the UK and New Zealand. We selected these because they are to some degree comparable. New Zealand is perhaps not a self-evident choice, but the country is very interesting in this connection because of its early and very enthusiastic adoption of the New Public Management.

This exercise shows both similarities and differences with the Norwegian steering and monitoring framework. Differences are predominantly in the organisation and coordination of the relevant ministries – there is nothing comparable to the Norwegian sector principle in any of the three countries. (The Swedish sector principle is considerably weaker.)

Sweden and Finland, like Norway, uses ‘management by results’ steering system, which is implemented through ministry allocation letters and responding reports from the research and innovation agencies. The research agencies may be steered by more than one ministry (in the case of the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning) but nowhere else is there the proliferation of principals seen at RCN.

The UK has one ministry – the Department for Business, Innovation and Skills – with responsibility for the Higher Education Funding Councils, the Innovation Agency and the (seven) Research Councils.

In New Zealand, we focus on the Marsden Fund, which is administered by the Royal Society of New Zealand (ie the academy of sciences) on behalf of the Ministry of Science and Technology. The Tertiary Education Commission also runs a performance-based research funding system in the universities.

3.1 Finland

3.1.1 Overview¹¹

Finnish R&D policy is centralised with priorities developed in the Government’s Research and Innovation Council (RIC). Its members include representatives from the Ministry of Education, the Ministry of Employment and the Economy, and the Ministry of Finance.

The RIC is the key advisory body in matters of research, education and innovation policy. It is active in the formulation of guidelines for the government as well as in the coordination of other actors involved in research policy.

The major research and innovation agencies are Tekes (technology and innovation) and the Academy of Finland (research).

The Academy houses four research councils

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

Priorities for research policy are mainly set out through strategic documents as issued by the RIC. Since 2007 there is also an Advisory Board for Sectoral Research,

¹¹ This chapter is partly based on the 2011 Technopolis report to the Norwegian Fagerberg Committee Research Support to the Fagerberg Committee. Volume 2 (Technopolis Group 2011a, 2011b)

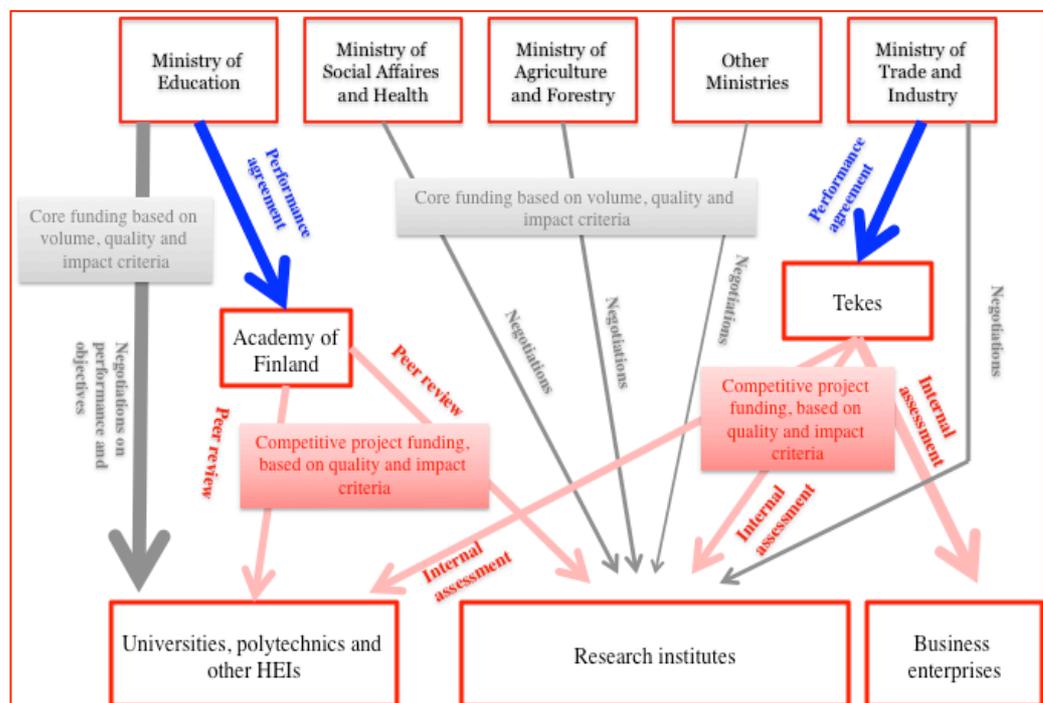
established by the Ministry of Education to coordinate public sectoral research policy. The aim is to improve ministries' commissioning know-how, focus sectoral research and step up the utilisation of research results across the ministry sectors. The board publishes plans for thematic areas for the governmental strategy documents. Each research theme should be of interest to several ministerial sectors and also involve the relevant ministries.

The Academy and Tekes subsequently implement the thematic priorities, but typically, the research and innovation programmes are open and allow or encourage bottom-up by initiatives from research performers.¹²

3.1.2 Ministerial steering and monitoring

Ministerial steering is done through horizontal negotiated agreements and vertical monitoring of research performance.

Figure 4 Mechanisms for the steering of Finnish R&D agencies and R&D performers and allocating funding



Source: Technopolis (originally published in Research Support to the Fagerberg Committee. Volume 2 (Technopolis Group 2011a, 2011b)

Steering mechanisms vary between ministries. Predominantly, budget agreements are developed through negotiation. Objectives and performance targets are set either in performance agreements or in strategic plans and comprise: impacts and operational performance; resources; and, occasionally, indicators to be used.

3.1.3 The Academy of Finland

The Academy of Finland signs a performance agreement contract with the Ministry of Education and Culture on a yearly basis. The current one has been signed on the 10.1.2011 and concerns the targets and objectives sets for the year 2011/2012. The performance contract clearly states the mission of the Academy of Finland, under six major points described in the Act of the Academy of Finland (922/2009).

¹² Erawatch, research inventory report (2009)

Its role as the “*central body for administering and funding research in the sector of the Ministry of Education and Culture*” is enhanced. Once the role, missions and objectives set in terms of science and innovation policy objectives, qualitative and quantitative targets are set. Its objective is thus to increase the quality of research (multidisciplinary and new fields); the attractiveness of research careers; and cooperation with universities and the Ministry of Education and Culture.

The targets concern the volume of project stock, the development of centres of excellence policy, particularly by increasing the individual centres, individual funding decisions on programmes. Importance put on the SHOK (Strategic Centres for Science, Technology and Innovation) priority given to post doctoral research careers.

The Research and Innovation Council is responsible for coordinating the agencies activities. Thematic priorities are set up at agency level, through the programmes run by the Academy of Finland (it is also the case for Tekes). The level of responsibility of the Academy is quite important. As of 2008 for instance, the Ministry of Education started to delegate the decision-making and responsibility for the development and monitoring of doctoral programmes to the Academy of Finland¹³.

Of the performance indicators under the performance agreement, quantitative targets are set in the performance agreement contract. The targets for the 2011 agreement regard the following five areas

- *Quality* – Percentage of foreigners of all experts used
- *Amount* – Average amount of funding granted (general research appropriations) and the percentage of research projects of at least four years duration of all research projects (and general research appropriations, from 2010 Academy projects)
- *Diversity* – Number of completed final evaluations of research programmes and field of research and disciplinary evaluation and the number of participants to the Science competition *Viksu*
- *Cooperation* – Ongoing research programmes; targets for operational efficiency; percentage of the total handling cost of the funding decisions; percentage of the total handling cost of the funding activity of applications; targets for outcomes and quality control; number of research funding applications processed; development of quality assurance system
- *Operational efficiency* – expressed as the share of budget devoted to administration

There are also three targets for human resources management and development: human resources (measured in person-years); work satisfaction (measured on a barometer); and the number of sick days per person, per year. These indicators are part of a more general reporting system. In 2008, the Academy of Finland and Tekes developed the *Impact Framework and Indicators for Science, Technology and Innovation* (VINDI), which aims to create an overall view of effectiveness of science, technology and innovation.

This performance contract is also accompanied by “soft steering”. The steering is based on management by objectives, including negotiations on objectives and targets. The implementation of steering mechanisms within the Ministry of Education, such as the Advisory Board may have effects in increasing the steering up and planning through governmental priorities in the longer run.

¹³ The separation in research funding between Tekes and the Academy of Finland is clear: The academy of Finland is in charge of funding basic research whereas Tekes is in charge of funding technologic applied research and cooperation between public and private entities.

3.1.4 Tekes

Tekes is one of the agencies of the ministry of Employment and the Economy (TEM). Performance guidance of Tekes is done by the Enterprise and Innovation Department of the Ministry of Employment and Economy and involves setting a balance between targets and resources and between regulatory and developmental activities.

The ministries regularly commission assessments of institutes and agency performance. In the case of Tekes, the Ministry runs triennial evaluations. The studies are carried out by external experts.

A performance agreement is settled each year regarding: objectives for impacts and operational performance; development of Intellectual resources and quality; financial resources; and indicators used in the monitoring of objectives.

Tekes' objectives are hence to enhance the following:

- Productivity and renewal of industries (young, innovative companies and growth companies)
- Capabilities for innovation activities (internationality of innovation activities and strong and networked 'strategic centres')
- Wellbeing (sustainable energy, social and healthcare service system and the information society)
- Tekes of the future (be an inspiring, influential and responsible actor)

A strong responsibility is held by the agency to determine its own strategy. The Tekes Board decides on Tekes' general policies and broad-reaching issues with fundamental significance such as the initiation of the Tekes' programmes.

According to the strategy published early 2011, Tekes programmes will be developed along two lines. Some will target long-term development of skills of anticipated future importance, stressing public research. The needs of SMEs will be catered for through a separate and particularly agile model of programme activities.

Each year, programmes are assessed according to the performance indicators set in the Finance Act and the Budget Decree. The annual budgets for Tekes are determined by parliament. Tasks and performance indicators of Tekes are negotiated with the Ministry every year and laid down in a performance agreement. In 2008, the Academy of Finland and Tekes developed VINDI, which aims to create an overall view of effectiveness of science, technology and innovation.

Corporate steering methods are described in the Ministry of employment and economy website and involve regulatory as well as development issues.

There are no separate risk management and quality management systems. There are two cycles. The first is a four-year cycle (aligned with political election process) for thorough review of the strategy (involving scenario planning, intensive stakeholder interaction, strategy writing, strategy implementation) and an annual updating process around the performance agreement with the Ministry. The second is the annual cycle, which interacts with customers and stakeholders and provides reasoned visions of the drivers of R&D and innovation, new opportunities and strategic choices required for success. It results in an updated rolling five-year budget plan and for the performance agreement for the next year with the Ministry.

Tekes also reports to the Ministry of Employment on a quarterly basis on its performance according to three overall objectives as developed through the Tekes strategy:¹⁴

- *Capabilities in innovation activities* – regarded as the total budget of enterprise projects funded by Tekes; the level of challenge and novelty value in the projects funded; the number of network contacts in Tekes and SHOK programmes;

¹⁴ www.tekes.fi/en/community/Objectives/555/Objectives/1426

- enterprise funding to public research organisations in Tekes projects; and the share of internationally cooperating projects of the funding
- *Productivity and renewal of industries* – regarded as the share of SMEs of total enterprise funding; the number of customers Tekes has funded during last five years; the number of newly established companies as customers; and the number of growth enterprises and potential growth enterprises as customers
- *Environment and wellbeing* – regarded as the funding for R&D activities in energy and environment sector as well as those in the health and wellbeing sector; the number of new products, processes and services created in the projects of information and communication sector; and the funding invested in workplace development

Figure 5 Tekes performance indicators

- **Objective 1: capabilities in innovation activities**
 - The total budget of enterprise projects funded by Tekes
 - The level of challenge and novelty value in the projects funded
 - Number of network contacts in Tekes and SHOK programmes
 - Enterprise funding to public research organisations in Tekes projects
 - The share of internationally cooperating projects of the funding
- **Objective 2: productivity and renewal of industries**
 - The share of SMEs of total enterprise funding
 - Number of customers Tekes has funded during last five years
 - Number of newly established companies as customers
 - Number of growth enterprises and potential growth enterprises as customers
- **Objective 3: environment and well-being**
 - Funding to R&D&I activities in energy and environment sector
 - Funding to R&D&I activities in health and wellbeing sector
 - Number of new products, processes and services created in the projects of information and communication sector
 - Funding to work-place development

3.2 Sweden

3.2.1 Overview

The Swedish Parliament decides on research policy every four years by passing the research policy bill prepared by the government and in particular by the Ministries of Education and Research, and of Enterprise, Energy and Communications.

The Ministries of Education and Enterprise have both set up specific bodies with advisory functions vis-à-vis the government; there is a research policy council and an innovation policy council, which both coordinate policy. In support, the Ministry of Enterprise houses the Growth Analysis Agency that produces statistical and economic analyses related to R&D.

There are three main research councils, and one innovation agency:

- The Swedish Research Council (VR)
- The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas)
- The Swedish Council for Working Life and Social Research (FAS)
- The Swedish Governmental Agency for Innovation Systems (VINNOVA)

Research policy is the responsibility of the Ministry of Education and Research. Other ministries, with sector interests in research, communicate and interact with the Ministry of Education in order to push their own priorities through. Innovation policy is the responsibility of the Ministry of Enterprise, Energy and Communications. The FORMAS research council falls under the remit of the Ministries of Environment and of Rural Affairs. The Ministry of Health and Social Affairs is responsible for the FAS council.

Sweden has comparatively small ministries that in essence direct policy and distribute funding. It is the national agencies that carry out and monitor much of the policies.

3.2.2 Ministerial steering and monitoring

Swedish governmental agencies are generally responsible for planning and executing programmes, and in practice carry out and monitor the majority of policies. Only the most recent research and innovation bill (2009) sets specific guidelines on the allocation of funds to Strategic Research Areas and HEIs.

The Swedish research funding organisations have a strong autonomy and are steered by the ministries following a management by objectives logic. They are responsible for the internal organisation and human resources, but follow the ministry's decisions on strategy and guidelines. The ministries send instructions in the form of regulations with general objectives and annual allocation letters (including priorities and resources to be allocated). Agencies have the obligation to do an annual report about outcomes and costs.¹⁵

This system has recently been reformed in order to improve its efficiency. One of the major modifications regards the requirements of agencies to report their results. They have been streamlined, made less formalised to ensure better flexibility and freedom when designing an annual report. Allocation letters have also been modified to cope with this issue. Thus, the funding received for research is increasingly becoming performance-based.¹⁶

The research and innovation agencies report back to the ministries on an annual basis. The agency responses are subsequently used to develop future new objectives and requirements. Agencies also can receive special assignments and objectives, which tend to be reported separately.

The research agencies' autonomy has a direct consequence on steering. Steering is implemented through management by results, which works according to two main ideas – delegation and information.

According to the first, the ministries leave smaller decisions, such as research and innovation agencies' internal organisation to the agency itself. The role of policymakers is to articulate goals and guidelines for the agency and the follow-up of agency results. The principle on information refers to the instructions from the ministries to the research and innovation agencies and which are made up of a) regulations with general objectives, and b) annual allocation letters. The latter outlines what kind of activities the agencies should prioritise and the resources assigned.

A major change is that the requirements of agencies to report their results have become increasingly streamlined (less formalised), in an attempt to relieve the agencies of their periodically heavy workloads. The allocation letters have also been shortened. The below Figure 6 and Figure 7 summarise the 2012 requirements against the Research Council and the innovation agency VINNOVA.

The allocation letter division of labour is organised as followed. The government's task is to formulate the overall goals for the administration and to grant the finance necessary for the task at hand. The agencies' duty is to execute their tasks in line with the assigned objectives, which encompass both activities and outcomes. Objectives should be as precise as possible, preferably measurable and time specific. In practice, the Swedish ministries have different options in their method of steering. Agency goals could for example be formulated in a way that allows more or less room for interpretation. Of course, the amount of funding assigned to the individual objectives matter and would limit the agencies' room for manoeuvre.

¹⁵ Technopolis Group, "Research support to the Fageberg Committee", Vol. 2, 2011, p. 182.

¹⁶ See Technopolis Group, "Research support to the Fageberg Committee", Vol. 2, 2011, p. 191.

Figure 6 Summary of the 2012 Allocation Letter to the Swedish Research Council outlining the Research Council's reporting requirements

- Goals and reporting requirements

The Swedish Research Council should outline and comment on

 - Research funding: eg international quality of supported research, support to research centres, success rate of applications, average project size, activities undertaken to strengthen long-term conditions for research, funding support statistics according to age and gender of researcher
 - Strategy for, and activities undertaken to promote equality in research. The Research Council should in particular comment on grant allocation in the medical and educational disciplines
 - EU and international research collaborations, including work undertaken by the Council, Swedish participation and costs of participation
 - Strategies and analyses (including evaluations) undertaken and their conclusions. The Research Council should also comment on Swedish research in an international light, along with global research trends and current research policy issues
 - Communication, and which target groups have been reached through which communication channels, and outcomes of activities undertaken
 - Research Infrastructure and which institutions have received RI support from the Council. Costs of participating in RI initiatives, work undertaken to facilitate the optimal use of RI in Sweden, as well as the national need of RI in relation to other research funding
 - Other activities including undertaken vis-à-vis research in culture and cultural heritage, Polar region research activities, work and development relating to the use of laboratory animals
 - Prediction of the Council's expenditure for 2012-2016
- Specific assignments

Specific assignments include the Research Council's advisory role to UNESCO, individual research programmes commissioned by ministries, activities undertaken to support interdisciplinary research and other particular or ad-hoc requests and projects
- Research funding data

Amount of Research Council grants allocated to Humanities and Social Sciences, Medicine and Health, Natural Sciences and Engineering, Educational research, Research Infrastructure, International collaborations and other major budget posts

Figure 7 Summary of the 2012 Allocation Letter to VINNOVA outlining the Innovation Agency's reporting requirements

- Goals and reporting requirements (Research, Development and Innovation)

VINNOVA should outline

 - What priorities lie behind the agency's interventions and how evaluation and foresight studies have played a role in the development of such interventions
 - Direct and indirect changes of funding in response to the latest government White Paper, in particular for production technology, transport, aeronautics, security and risk management
 - Improvements in activities aimed at SMEs, including internationalisation
 - Integration of internationalisation in VINNOVA's activities as a whole
 - Internal strategies and analyses undertaken and follow-ups on conclusions. Outline how VINNOVA's activities contribute to the utilisation of research results. Outline activities planned in the coming year, including for R&D in the fields technology, transport, communication and working life
 - Specific assignments and predications as outlined by the government
- Organisation (activities and assignments)

At least a quarter of VINNOVA's activities should be reviewed on an annual basis, and all activities reviewed quadrennially. VINNOVA's activities on a EU and international level should be outlined. VINNOVA should assist the government in its development of an innovation strategy

Specific assignments

Specific assignments include VINNOVA's input in Nordic collaborations. VINNOVA should also report back on Swedish participation in FP7 and participate in the development of a Swedish regional strategy. A number (15) of specific assignments are also outlined and need to be reported back on
- Innovation funding data

3.2.3 The Swedish Research Council

The Swedish Research Council (Vetenskapsrådet, or VR) is a government agency funded by the Swedish Ministry of Education, Research and Culture. VR has three main areas of responsibility involving research funding, research policy and science communication. VR provides support for basic research of the highest scientific

quality in every field of science. The goal, as formulated by the Swedish Government, is to “establish Sweden as a leading research nation.”

VR was established in 2001 by the Parliament, replacing five former research councils: the Swedish Council for Research in the Arts and Social Sciences, the Swedish Medical Research Council, the Swedish Natural Science Research Council, the Swedish Research Council for Engineering and Swedish Council for Planning and Coordination of Research.

Swedish agencies are generally autonomous and steered through performance based management. VR is responsible for setting its own strategy and set priorities within its programmes. There is one programme VR is administering together with VINNOVA, in which the Government specified the Strategic Research Areas and allocated funding directly to the Higher Education Institutions.

VR’s research strategy for 2009-2012 focuses on its core funding. Among the main goals of the strategy are the strengthening of the Swedish research funding and of its long-term perspective and to focus resource allocation for quality and competition. For the post-2012 period, VR intends to increase resources for basic research, infrastructure and European, Nordic and global cooperation and continue its support for research environments, including the Linnaeus Grant for the 2013-2016 period¹⁷.

VR monitors the results of its projects and specifically looks at questions related to research policy. It strives to develop a relevant statistics and methods base, focusing particularly on bibliometric studies and collaboration with Statistics Sweden (SCB).

VR focuses its evaluation activities mainly on four dimensions:

- Research areas
- Funding instruments
- Procedures for assessment of applications
- Effects of research funding on communities or on societies, in general

According to VR’s Evaluation Strategy, the most common type of evaluation performed by VR is on the scientific quality of research areas, specifically concentrating on VR’s own funded programmes. The performance indicators monitored generally relate to activities, finance, and human resources. For evaluating its funding instruments, VR monitors the various types of grants (programme grants and permanent grants) and the types of areas, categories of researchers, or organizational initiatives they target. The performance indicators of the procedures for assessment of applications evaluation criterion relate to the assessment criteria used, or the organisation of the assessment process¹⁸.

3.2.4 Vinnova

VINNOVA is a government agency under the Ministry of Enterprise, Energy and Communications. It was created in 2001 after a merger of the technology division of NUTEK (The Swedish Agency for Industrial and Technical Development) and the Swedish Agency for Transport Research as well as part of the Agency for Work Organisation. It was created in the context of an increasing need for the utilization of scientific results. It is in charge of conducting the innovation policy. It is also the national contact agency for the EU Framework Programme for R&D. Its mission is stated in its instructions, which entered in force on the 21 December of 2009.

¹⁷ VR Research Strategy (2009-12):

www.vr.se/inenglish/aboutus/activities/analysisevaluationandfollowup/thecouncilsresearchstrategy20092012.4.76ac7139118ccc2078b80003530.html

¹⁸ VR Evaluation Strategy:

www.vr.se/inenglish/aboutus/activities/analysisevaluationandfollowup.4.69f66a93108e85f68d48000223.html

VINNOVA mainly acts in the fields of human resource development, public/private collaboration in research and innovation, and business experiments to test and introduce new technology.

VINNOVA's mission, as described in the 2009 regulations SFS 2009:1101 (in Swedish) from the government. The main goal of VINNOVA is to promote sustainable growth via need-oriented research (article 1), increased collaboration between different entities (article 2) and highlight industrial research institutes role. It also emphasizes its role in the efficient use of EU funds, under the Ordinance (2007:713) on regional growth initiatives. In terms of management, the articles 5 to 9 describes its organisation and the coordination with other agencies, and the way a coordination group composed of agency managers should lead the collaboration. The mission of the group as set in the article 7 is to collaborate and jointly develop analysis, strategies and research, and above all to take steps to develop and renew forms of research.

An important part of VINNOVA's activities consists of increasing the cooperation between companies, universities, research institutes and other organisations in the Swedish innovation system. This is done in a number of ways, including long-term investment in strong research and innovation milieus, investment in projects to increase commercialisation of research results and by creating catalytic meeting places in the form of conferences and seminars. The support programmes target universities, SMEs, research institutes, local and regional authorities, and individual researchers.

VINNOVA's shorter-term tasks are set in qualitative terms in its annual letter of instruction. It reports against these in its annual report in a mixture of qualitative and quantitative terms, using whatever indicators it sees as appropriate. One specified quantitative indicator is the share of its budget that is spent an administration.

VINNOVA sets its own strategy and designs its own programmes. In 2010, it initiated a new strategy process aiming at improving effectiveness and efficiency in innovation policy in Sweden. To do so, it chose to focus on four main challenges:

- Sustainable and Attractive Cities
- Health, Wellbeing and Medical Care
- Competitive Industry
- Information Society 3.0

The international dimension is also very strong to VINNOVA's strategy and activities, as it clearly sees international cooperation and competitiveness as major objectives.

3.3 United Kingdom

3.3.1 Overview

In the UK, the majority of the research budget (70-75%) is the responsibility of the (Ministry) Department for Business, Innovation and Skills (BIS) with the remaining funds coming from a number of other government departments. The funding is channelled via the Higher Education Funding Councils (HFCs) for England, Scotland and Wales (in Northern Ireland higher education funding is distributed by the Department for Employment and Learning, DELNI) and the seven Research Councils

- The Arts and Humanities Research Council
- The Biotechnology and Biological Sciences Research Council
- The Engineering and Physical Sciences Research Council (EPSRC)
- The Economic and Social Research Council (ESRC)
- The Medical Research Council
- The Natural Environment Research Council
- The Science and Technology Facilities Council

Since 2007 there is also, usually referred to as the innovation agency, the Technology Strategy Board, which is also under the remit of the Department for Business, Innovation and Skills.

The Department for Business, Innovation and Skills BIS is responsible for both the HFCs and the Research Councils, and holds their budgets. BIS takes its authority from the government. As for other ministerial research budgets, these are the responsibility of individual departments with funding focused on research to meet departmental policy needs. Responsibility for funding is typically delegated to the departmental Chief Scientific Advisor.

3.3.2 Ministerial steering and monitoring

The aims and objectives, responsibilities, accountability and operational framework for the Higher Education Funding Council for England, HEFCE, are set out in a Management Statement, and the terms and conditions under which BIS makes funds available is set out in a Financial Memorandum. BIS and HEFCE revise both documents periodically. HEFCE's strategy, operational plans and key performance targets are agreed with the department annually and performance is reported to the department quarterly and in annual reports. HEFCE also provide regular financial reports and the department undertakes period risk assessments of HEFCE and its activities.

Every year, HEFCE receives a financial allocation letter annually from the government that defines the size of HEFCE's budget and assigns it to broad funding categories including the block grants for research and for teaching.

HEFCE's strategy and performance measures are aligned to BIS' own strategy and objectives. Any changes to government policy will be reflected in changes to departmental objectives, which will subsequently result in streamlined changes to HEFCE's objectives, targets and plans. As such, although HEFCE allocates funds without interference from policymakers, the government does guide its policy framework.

As for the **seven research councils**, BIS is responsible for allocating the overall science budget to different research areas. The budgets are based on negotiations with each Council. This process has changed over time in line with experiences of both sides of the table (BIS and the Research Councils). While BIS can in theory make substantial budget modifications, this is rarely the case. This is a long-standing phenomena dating back to the end of the First World War and the report of the Haldane Committee, and the eponymous Haldane Principle¹⁹.

Since 2005 the research councils have used a common tool for annually reporting results back to government, known as the Economic Impact Report (initially called the Economic Impact Reporting Framework). The report includes a range of performance metrics to measure progress towards the objectives as elaborated on in the Research Councils' delivery plans. The report overall includes qualitative data, but the Councils also have the opportunity to elaborate on the context of the data through the following categories:

- Overall economic impacts
- Innovation outcomes and outputs of firms and governments
- Knowledge generated by the research base
- Investment in the research base and innovation
- Framework conditions
- Knowledge exchange efficiency
- Demand for innovation²⁰.

¹⁹ This principle means the separation between research of direct utility to government, to be steered by ministries, and research carried out for more general social objectives, under the remit of research councils, with decisions on where to expend money being decided by the research community itself (peer review). The Haldane Principle is still valid today, however peer reviews have evolved to increasingly include not only academics but also research-literature industry people

²⁰ www.mrc.ac.uk/Newspublications/Publications/EIRF

- Minutes meeting HS on Annual report 2011 / MBO

3.3.3 The EPSRC

The UK's Engineering and Physical Science Research Council's (EPSRC) mission is set out in the 1993 Government White Paper on Science, Engineering and Technology, entitled *Realising our potential*²¹:

- Promote and support high quality basic, strategic and applied research and related postgraduate training in engineering and the physical sciences
- Advance knowledge and technology (including the promotion and support of the exploitation of research outcomes)
- Provide trained scientists and engineers, which meet the needs of users and beneficiaries, thereby contributing to the economic competitiveness of the UK and the quality of life

At a strategic level, the EPSRC defines three main goals specified in its Strategic Plan:

- “Delivering impact: ensure excellent research and talented people deliver maximum impact for the health, prosperity and sustainability of the UK.
- Shaping capability: shape the research base to ensure it delivers high quality research for the UK; the research portfolio will be focused on the strategic needs of the nation, such as green technologies and high-value manufacturing
- Developing leaders: commit to greater support to the world-leading individuals who are delivering the highest quality research to meet UK and global priorities.”²²

The EPSRC is funded by the Department for Business Innovation and Skills, which answers to the Parliament for the performance, use of funds and policy frameworks of the public bodies it sponsors. The role of the EPSRC in its relationship with BIS is set out in a Management Statement and Financial Memorandum²³.

According to the Council's Code of Practice and Management Statement (p34), BIS sets the general strategic priorities for the science sector and allocates a specific amount of grants to the Council according to the Government's long-term investment framework for British science for the current period (2004-2014). BIS then publishes a science budget allocation booklet in which it also formulates the strategy and plans what the EPSRC must address and deliver. However, the requirements are only at an overall strategic level, while the EPSRC Council has the responsibility for the day-to-day activities and decisions on its strategies, programmes and projects that are shaped without Government's involvement.

The EPSRC measures the performance of its activities by looking at both its research performance outputs indicators (the first four, listed below) and research outcomes (the last two, listed below), which are as follows²⁴:

- *Human Capital* – principal investigators and research fellowships
- *Knowledge Generation* - number of grants assessed for reporting; refereed and non-refereed publications; co-authorship of refereed publications (both with international and industrial partners)
- *Human Capital* – number of new PhD students and research student; total number of new students; total number of PhD students currently supported; that for research students
- *Knowledge Transfer and Exchange* – knowledge exchange programmes

²¹ EPSRC, Mission Statement: www.epsrc.ac.uk/about/facts/Pages/mission.aspx

²² EPSRC, Strategic Plan: www.epsrc.ac.uk/plans/strategicplan/Pages/default.aspx

²³ EPSRC, Code of Practice for Council Members (2006): www.epsrc.ac.uk/SiteCollectionDocuments/other/CodeofPracticeforCouncilMembers.pdf

²⁴ EPSRC, Research Performance and Economic Impact Report 2011

- *Intellectual Property Activity* – patent applications; patents granted; spinouts (new businesses created)
- *Destination of leavers* – based on the proportions of those in further study; wider public sector; private sector; unemployed; or unknown or other

The EPSRC also reports its performance based on an Economic Impact Performance Framework (designed with BIS in 2007) relating to the following four categories²⁵:

- *Delivering highly skilled people to the labour market* – proportion (and number) of EPSRC-funded PhDs taking up employment in business or public services; net spending on PhDs; contribution of employers to collaborative postgraduate training
- *Improving the performance of existing businesses and creating new businesses* – spend on collaborative research with users (and as a % of total research grant spend); number of user organisations collaborating on current grants; number of licenses, patents and spinout companies reported; spending on programmes to promote commercialisation and enterprise; proportion of projects reporting co-publications with industry; value of investment with TSB
- *Improving public policy and public services* – value of grants involving government or public sector organisations; number of strategic partnerships with government or public sector organisations
- *Attracting R&D investment from global business* - UK ranking in citation impact among G8 countries (for mathematics, physical sciences and engineering)

3.3.4 The ESRC

The UK's Economic and Social Research Council's (ESRC) mission is to:

- Promote and support (by any means) high-quality basic, strategic and applied research and related postgraduate training in the social sciences
- Advance knowledge and provide trained social scientists who meet the needs of users and beneficiaries (thereby contributing to the economic competitiveness of the UK, the effectiveness of public services and policy, and the quality of life)
- Provide advice on, and disseminate, knowledge and promote public understanding of the social sciences

The ESRC was established by Royal Charter in 1965 and receives most of its funding through the Department for Business Innovation and Skills (BIS). According to its Annual Report 2010-11 (p55), the ESRC's performance indicators are the following:

- Academic publications from ESRC research investments
- Papers published in refereed journals
- ESRC projects achieving highest approval ratings
- Proportion of ESRC students submitting PhD theses within four years

The ESRC also measures the economic impact of its activities based on an Economic Impact Reporting Framework (EIRF), common to all of the UK's Research Councils. ESRC's impact indicators for each objective are the following²⁶:

- *Overall economic impacts* – through world-class social science; skilled people; world-class infrastructure; international leadership; partnerships
- *Innovation outputs and outcomes* – income from commercial activity; collaborative funding and number of such projects; spending on knowledge transfer; external representation in governing bodies; number and type of strategic partners; placements; number of public policy and business-oriented

²⁵ EPSRC Economic Impact Baseline 2010, www.epsrc.ac.uk/newsevents/pubs/corporate/reporting/eib2010/Pages/default.aspx

²⁶ ESRC, Economic Impact Reporting Framework 2009-2010: www.esrc.ac.uk/funding-and-guidance/tools-and-resources/impact-evaluation/economic-impact-reports.aspx

seminars or workshops and those to help develop entrepreneurial and commercialisation skills

- *Knowledge generation* – refereed publications; principal researchers; research fellows; research students; submission rates after five years; recruitment and retention; studentship diversity; quality of research; non-refereed publications
- *Investment in the research base* – grant-in-aid received; other income; total income; % DEL and Other income; expenditure on responsive mode; new capital spend; spending in proportion of expenditure attributable to admin costs; value of ESRC support for new research resources and the proportion of expenditure dedicated to it and their level of usage; support to cross-council programmes
- *Public engagement* – funding for public engagement; public interaction and engagement (attendance at the Festival of Social Sciences; other interaction...); number of researchers trained in media/public engagement

BIS introduced the Performance Management System for all the UK Research Councils. Part of this system is the ESRC's Economic Impact Reporting Framework (EIRF) based on an Interim Structure provided by BIS for each reporting year. The framework contains information on relevant aspects of the ESRC's performance that could feed into the Government's objectives for the UK's science base.

3.4 New Zealand

3.4.1 Marsden Fund

The Marsden Fund is New Zealand's agency that invests in investigator-initiated research that expands the knowledge base and is not subject to socio-economic priorities. The Fund's Terms of Reference stipulate two major objectives for the Fund²⁷:

- Enhance the quality of research in New Zealand by creating increased opportunity to undertake excellent investigator-initiated research
- Support the advancement of knowledge in New Zealand, and contribute to the global knowledge base

The Fund also aims to contributing to building advanced skills in New Zealand and of the early-career researchers.

The Fund is administered by the Royal Society of New Zealand on behalf of the Ministry of Science and Innovation. The Marsden Fund Council has the responsibility on designing the allocation of funds to priorities (within the given budget) and to advise the Royal Society of New Zealand on this. The latter normally accepts the recommendations from the Council, but in the event the Royal Society disagrees with them, it should notify the Minister and call a review panel with members nominated by all three counterparts (the Minister, the Royal Society and the Marsden Fund Council) to review the recommendations of the Council. In this case, the Minister has the final decision on agreeing or disagreeing with the Council's advice, based on the results of the review panel²⁸.

The performance indicators for the Fund are set out in the Memorandum of Understanding agreed between the Royal Society and the Marsden Fund Council²⁹.

The Annual Investment Impact Report 2011 of the Royal Society of New Zealand highlights the following performance indicators³⁰:

²⁷ Marsden Fund, Terms of Reference 2012:
www.royalsociety.org.nz/programmes/funds/marsden/about/tor/

²⁸ Marsden Fund, Terms of Reference 2012

²⁹ Royal Society of New Zealand, Investment Impact Report 2011, p.4,
www.royalsociety.org.nz/publications/reports/evaluation/iir2011/

- *Outputs* – investment budgets per theme, number of research contracts funded, number of new contracts funded over the period of 2009-2011, success rates of funding applications
- *International collaboration* – proportion of Marsden contracts that begin in collaboration
- *Research recognition* – number of publications, patents and software reported by grant recipients, invitations to conference talks
- *Knowledge and human capacity development* – total number of Principal Investigators and Associate Investigators funded, percentage of grants with postdoctoral fellows, number of postgraduate students on grants, awards and prizes received by fellows
- *Research productivity and quality* – number of refereed journal articles, books, invited presentations, public outreach, level of Peer Review Publications per dollar spent, number of articles published in the top 2% Journals, citation impact and the proportion of works that are cited (according to Scopus)
- *Tangible socio-economic benefits* - direct financial opportunities arising from Marsden-funded research (amount of dollars per year) – in the form of commercialization of research results, indirect opportunities, improvements in skills, new methods/instrumentation, build basic knowledge, better informed policy-makers, unexpected outcomes

The monitoring of the efficiency and effectiveness of the management of the Marsden Fund is done by the Ministry of Research, Science and Technology. The Ministry follows the accomplishment of the Terms of Reference and the Memorandum of Understanding between the Marsden Fund and the Royal Society.³¹

The Ministry and the Royal Society are not involved in any regular meetings of the Marsden Fund Council. The Marsden Fund Council supports the Royal Society to prepare biennial progress reports to the Ministry of Research, Science and Technology on the evolution in terms of reaching the performance targets set in the Memorandum of Understanding with the Royal Society. The Marsden Fund Council communicates with a designated person in the Royal Society in the case of requests of services³².

3.4.2 Performance-Based research fund (PBRF)

The Performance-Based research fund (PBRF) has the purpose of ensuring that excellent research in the tertiary education sector is encouraged and rewarded. For this, its main activity is to assess the research performance of Tertiary Education Organisations (TEOs) and to offer them funding on the basis of their performance. The TEOs participate in the Fund on a voluntary basis.

The main goals of the PBRF are the following³³:

- Increase the average quality of research
- Ensure that research continues to support degree and postgraduate teaching
- Ensure that funding is available for postgraduate students and new researchers
- Improve the quality of public information on research outputs
- Prevent undue concentration of funding that would undermine research support for all degrees or prevent access to the system by new researchers
- Underpin the existing research strengths in the tertiary education sector

The Performance Based Research Fund is administered by the Tertiary Education Commission (TEC) based on an annual Investment Plan agreed with the Ministry for

³⁰ Royal Society of New Zealand, Investment Impact Report 2011, p. 4-16.

³¹ Marsden Council, Terms of Reference 2008, www.royalsociety.org.nz/programmes/funds/marsden/about/council/

³² Marsden Council, Terms of Reference 2008

³³ PBRF: www.tec.govt.nz/Funding/Fund-finder/Performance-Based-Research-Fund-PBRF-/Purpose/

Tertiary Education. The Minister then approves annual “funding determinations” that set out the mechanism and approach of funding that the TEC uses to fund organisations³⁴.

The Fund focuses on three elements in its evaluations, which are the key indicators for measuring the performance of the Tertiary Education Organisations which apply for funding. The amount of funding is then dependent on the Tertiary Education Organisations’ (TEO) performance and it is calculated through a formula for each category of measures³⁵:

- *Quality Evaluation* – based on a peer review panels’ assessment of the research quality in participating TEOs according to the material shown in the researchers’ Evidence Portfolios (in themselves based on three components – research outputs, peer esteem and contribution to the research environment³⁶); the weighting of the separate categories; weighs for the different subject areas; and the full-time equivalent status of the participating TEO’s PBRF-eligible staff
- *Research Degree Completions* – shows the number of research-based postgraduate degrees completed within a TEO on an annual basis
- *External Research Income* – is used to reflect external research income received by a TEO. It is considered to provide a good proxy for research quality

The indicators are not part of a general reporting system. They were designed in 2002 by a Work Group of experts together with the Ministry and are specific for the funding offered to Tertiary Education Organisations through this fund. Based on the scores obtained for each indicator, the organisations are ranked and allocated funding based on formulas for a period of at least three years. The formulas are agreed beforehand by the Tertiary Education Committee and the Ministry³⁷.

The performance contract is strict in terms of how the funds need to be allocated and spent. Due to the fact that the performance indicators are used as a means to allocate appropriate funding through formulas to the TEOs, the steering of the fund is settled on a rather formal than soft note.

3.5 Findings from international comparison

Norway chose to have a single organisation act as both research council and innovation agency. Apart from RANNIS in Iceland, it therefore has no direct comparators. Clearly, the organisations described here have simpler tasks and none has to deal with the complexity of having 16 principals. That acknowledged, we can nonetheless learn some things from the practices described here.

- Goals are generally set at two levels: broad missions and specific tasks – just as in the Norwegian system. These tend to be separately reported
- Generally, however, deciding what programmes to design and run is a matter for the agencies, not their principals. The agencies therefore report and use indicators against their broad tasks, not at the programme level
- Where specified indicator systems are used, they contain small numbers of general indicators – at most 10-15 – at the level of the whole agency and are standard across the whole range of activities
- There is a clear separation between required quantitative indicators and goals on which the reporting agency can decide what mixture of quantitative and qualitative reporting to employ

³⁴ PBRF Funding determinations: www.tec.govt.nz/Resource-Centre/Ministerial-determinations/

³⁵ PBRF User Manual, 2006, p. 4

³⁶ PBRF Audit Methodology 2012, p.2: www.tec.govt.nz/Funding/Fund-finder/Performance-Based-Research-Fund-PBRF-/Publications

³⁷ Ibid.

- The anglo-saxon agencies are in systems that increasingly demand indicators and assessments of **impact**; the Nordic systems are less demanding and largely content themselves with input and process indicators
- Where there is overall monitoring or evaluation of the health of the whole research and innovation system, it is separate from agency reporting

4. Findings

In a narrow sense, the new MBO system is intended to make the process of steering RCN more streamlined and comparable through the use of a common goal and reporting structure. As we read the history, the new MBO system more widely provides an opportunity to

- Improve the quality of the goals the ministries set for RCN by making them SMARTer
 - Making it clearer what the target performance is
 - And whether it has been achieved
- Increase the level of abstraction of the goals, giving the agency greater discretion to decide how to implement the goals of the ministries
- Provide a channel for more clearly distinguishing the wide and the narrow aspects of ministries' sector responsibility for research
- More clearly distinguish goals from guidelines
- Improve coordination across the ministries through the use of a common set of objectives
- Increase transparency for those inside and outside RCN's governance system about whether and how RCN is improving the overall functioning of the national research and innovation system

At this early stage, it is clear that the MBO system has had a significant effect on KD's practice. Other ministries have adapted their practice to be consistent with the new system but have generally yet to be convinced that the new arrangement adds value. For the most part, the new goals are simply overlaid on the instructions the ministry would in any case have given. A lot of the real steering is achieved through the ministries buying into or ordering activities (primarily programmes), which are at a level of disaggregation that is below the high-level goals used in the MBO.

The effect on RCN reporting appears to be to increase its length – at least in part because of the degree of repetition required across different ministry reports. The thirteen goals involve a degree of overlap, which also increases the length and leads RCN to make potentially arbitrary decisions when allocating money and indicators among goals. For example, patents are used as indicators for three different goals in the overall report. BIA projects are treated under Goal 1.3 (research-based innovation) but should also have behavioural additionality, increasing industrial R&D expenditure (goal 1.4). Given the complexity of the system RCN tries to describe, it is barely conceivable that such ambiguities could completely be removed.

Nonetheless, it is positive that the different ministries have largely been willing and able to work within a common system. The next step is for them collectively to take stock of the experience. So far, we have not been able to see an effect on coordination among the ministries or their requirements but now that the common format has been explored it should become more possible to see the coordination opportunities.

Clearly a more coordinated and standardised system is in RCN's and KD's interest. A key requirement for progress is that the ministries should have **incentives** to exploit the new system. They fulfil their sectoral responsibilities in bilateral dialogue with RCN. Before they become enthusiastic about a more coordinated approach they need to be able to see its added value. RCN has clearly demonstrated the value of shared programming, ie the activity level, by signing up multiple ministries to many programmes but not yet the value of shared objectives.

Pursuing a better-integrated and coordinated MBO system would, however, have significant benefits. In particular, it would provide a vehicle for SMARTening goals and therefore establishing success criteria, which are currently absent from the MBO. It would also provide opportunities for the ministries more clearly to express their

goals in relation to both their narrow and their wide sector responsibility for research, enabling more explicit coordination – for example of basic research. Separating overall goals from guidelines and specific tasks should allow the ministries over time to evolve a less detailed steering practice that is more consistent with the New Public Management and the core principles of MBO by largely avoiding steering at the activity level.

RCN certainly needs to explain to the ministries and the public where their money went and what it achieved. The reporting therefore has to pay a lot of attention – as it does – to inputs and how they were used. The MBO system seems to say a lot about RCN’s funding role but not much advice or meeting places. If these are important then perhaps they should also be visible.

As readers, we find the RCN annual report very cumbersome to digest, essentially because it has a formal character as a report to RCN’s principals. At the highest level, it should be answering the question “What did RCN do for Norway last year?” The answer is undoubtedly in there, but finding it is quite a task.

Foreign practice suggests that RCN could usefully report on its aggregate short-term effects using a modest number of indicators. Is it possible to make it a document that speaks not only to the ministries but also to the taxpayer? We could envisage a three-level document that would nonetheless be a simplification of the present system.

1. A short, top-level report that explains what the inputs and short-term outputs are, making generous use of trended indicators at the level of RCN as a whole. It could deal with new initiatives and assess broad progress with the different components of the national research and innovation system. It should make a high-level assessment of the health of the research and innovation system, based on existing materials such as the Indicator Report
2. An account of how RCN has used its resources in relation to the goals, how the activities (especially the programmes) map onto the goals and what the short term results are, again using indicators where possible
3. Shorter, ministry-specific reports that account for inputs and report on how RCN has dealt with specific tasks and guidelines, including indicators where appropriate, but not attempting to decompose the activities by ministry. That should satisfy the ministries’ need for accountability without attempting a complete decomposition of the activities that are shared among the ministries

The kind of MBO system is inherently short term in its focus because it is tied to budgetary accountability. It needs to be complemented by a longer-term perspective that recognises (as RCN itself points out in the 2011 Annual Report and as a number of studies have made clear³⁸) that many impacts can take a decade or more to appear. RCN’s limited use of impact evaluation makes it especially hard to appreciate such effects. But the impact of an organisation such as RCN is a combination of what it does today and what it did in the past. This needs to be recognised in order to give a proper account.

³⁸ RS Iserson, *Project Hindsight (Final Report)*. Washington, D. C.: Department of Defense, Office of the Director of Defense Research and Engineering, 1967; H Loellbach (Ed.), *Technology in retrospect and critical events in sciences (TRACES)*. Vol. I. Chicago: Illinois Institute of Technology Research Institute, Contract NSF-C535 with the National Science Foundation, 1968; H Loellbach (Ed.), *Technology in retrospect and critical events in science (TRACES)*. Vol. 2. Chicago: Illinois Institute of Technology Research Institute, Contract NSF-C535 with the National Science Foundation, 1969; Lennart Elg and Staffan Håkansson, *När Staten Spelat Roll: Lärdomar av VINNOVAs Effekstudier*, VINNOVA Analys, VA 2011:10, Stockholm: VINNOVA, 2011

