

# **Report of the Executive Board for 2007**

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***The Research Council is pleased to note that Norwegian research is flourishing, and that international research collaboration was given a more prominent role on the political agenda in 2007. The Council has been a driving force in the ongoing effort to boost investment in climate and energy research. The Executive Board nonetheless points out that the overall growth objective established in the government white paper "Commitment to Research" has yet to be achieved.***

### **Climate issues direct attention to the importance of research**

The award of the 2007 Nobel Peace prize to the Intergovernmental Panel on Climate Change (IPCC) and former US Vice President Albert Arnold (Al) Gore Jr. illustrates the importance of research and dissemination to our ability to understand and solve complex challenges to society. Reports from the IPCC – which included important contributions from Norwegian research – and the Norwegian Commission on Low Emissions, as well as the Norwegian Energi21 process and the cross-political agreement on Norwegian climate policy reached this winter in the Norwegian Storting, have all contributed to an emerging atmosphere of anticipation among the members of the research community as well as the public at large.

During 2007, the Research Council of Norway has played an active role in efforts to increase investment in climate and energy research, and the cross-political climate agreement reached in the Storting marked a breakthrough for more cohesive integration of research perspectives into climate policy. The Research Council has also contributed to the Energi21 strategy for R&D in the renewable energy sector. Initiated by the Ministry of Petroleum and Energy, the Energi21 process has gained broad-based support among the relevant energy stakeholders.

Climate research encompasses research on climate systems and developments in climate over time, and incorporates a wide array of subject fields. Researchers study the causes, impacts and potential solutions to the problems associated with climate change. Climate research is an important component of the activities under the International Polar Year (IPY) initiative. As a major player in global polar and climate research, Norway is investing a great deal of resources into IPY activities, and the Research Council is responsible for the Norwegian IPY secretariat. Additionally, in 2007 the Council launched a large-scale, coordinated research project to obtain a better picture of the future climate in the areas in proximity to Norway.

The climate issue adds another dimension to Norway's role as an *energy nation*. Norway has both the resources and the knowledge needed to enhance value creation from the energy sector, not least through its considerable experience with petroleum and gas activities. Norway is in an excellent position to become an international supplier of research findings, technology, expertise and services, within renewable energy and CO<sub>2</sub> capture and storage as well.

### **Enhanced quality in Norwegian research**

Both the Research Council's overall strategy and the government white paper *Commitment to Research* stress enhanced quality as a key objective for Norwegian research. High-calibre research is characterised by its soundness, originality, relevance to the subject field, benefit to society or practical utility – weighted differently for different disciplines. A number of

Norwegian disciplines have been evaluated in an international perspective and more such evaluations are planned. The evaluations thus far show that a great deal of positive work is taking place, although the scientific, organisational and administrative quality of research activities may still be said to vary somewhat. These evaluations form the basis for action plans designed to improve quality within the relevant field of study. Moreover, recent years have seen the launch of such quality-promoting measures as the CoE, CRI and OYI schemes.

One of the Research Council's most important measures for enhancing quality in research is the establishment of *Centres of Excellence* (CoEs). The 13 CoEs first established received very positive reviews in their international midway evaluation and their contracts were renewed for a new five-year period. In 2007 an additional eight CoEs were established. According to the evaluation, the CoE scheme has served to enhance quality in research, has made Norwegian research more visible nationally and internationally, and has helped to bring top international researchers and more funding to Norway. Important criteria for the success of the centres include excellence in scientific leadership and constructive interaction between the centre and its host institution.

The Executive Board notes that Norwegian research is flourishing, as is evidenced e.g. in international indicators. Norwegian researchers co-author a greater number of published articles with colleagues from abroad than previously, and Norwegian-authored articles are being cited more frequently than before. The citation index shows a strong upward trend from the 1990s. Fifteen years ago, Norway was the weakest of the Nordic countries; now, articles with Norwegian participation are being cited as frequently as those with Swedish or Finnish collaboration. Denmark remains quite a bit ahead of the other Nordic countries in this context.

As both developments in publication patterns and participation in the work of the IPCC indicate, international collaboration is essential to improving quality and helping to solve global knowledge challenges. With this in mind the Research Council is working actively to promote greater cooperation and synergy between Norwegian and international research and research-based innovation. Several new measures to cultivate dynamic networks and alliances between Norwegian and international players were implemented during 2007. These measures have been targeted in particular toward EU research policy initiatives and bilateral cooperation with priority partner countries.

### **Research for innovation**

Research and development have become increasingly important for innovation and growth in productivity. The Research Council's largest programme, the Programme for User-driven Research Based Innovation (BIA), comprises an open competitive arena in which funding is granted to the projects that have the greatest socio-economic or commercial potential, independent of industry or thematic area. Half of the R&D investment in Norway is being carried out by companies that have funding under the BIA programme as their only source of funding. The BIA programme has been running for two years, and it is already evident that the projects funded under it are highly innovative, with major value-creating potential. Many of the projects are supported by broad consortia that cooperate along value chains or across branches of industry. More than 90 per cent of the projects include cooperation with international companies or R&D communities. Thus, the project portfolio is helping to reinforce vital industrial policy priorities.

During 2007 the first 14 *Centres for Research-based Innovation* (CRIs) were approved. The CRI scheme represents a new, ambitious, innovation-oriented instrument. These centres are charged with developing top international expertise in areas that are essential to innovation and value creation. Their task is to strengthen long-term industry-oriented research in close collaboration between companies and research communities. A total of 98 companies and public institutions are participating in the scheme, and there are more than 300 researchers and 80 fellowship holders working at the various CRIs.

The *evaluation of the SkatteFUNN tax deduction scheme* was completed in 2007 by Statistics Norway in cooperation with the Nordland Research Institute, and examines the effects of the scheme since its launch in 2002. The main conclusion of the evaluation is that the SkatteFUNN scheme is functioning in accordance with its purpose, and is helping to mobilise R&D activity in the private sector. According to Statistics Norway, one crown (approx. EUR 0.12) in tax deduction under the scheme triggers two crowns of R&D investment from industry. The scheme is widely known, user friendly, reliable and inexpensive to administer.

### **Research policy input**

In the course of 2007 the Research Council drew up a number of strategies and action plans relating to important aspects of the Norwegian research establishment, including a proposed national strategy for research infrastructure, a policy for medical and health-related research, a strategy for research in the humanities, and a policy and action plan for efforts to advance gender equality and gender perspectives in research. Subject-specific evaluations have been carried out in the fields of economics and pharmaceutical research, and a new basic funding system for the independent research institute sector has been proposed.

*The national strategy for research infrastructure* applies for a ten-year period and encompasses new investment and upgrading of scientific equipment, large-scale research facilities, eInfrastructure and scientific databases and collections. The objective is to establish a research infrastructure that promotes quality and efficiency in Norwegian research, and that makes Norwegian research groups known internationally for their ability to provide outstanding research infrastructure, and to attract experts from other countries. The strategy will be followed up with three-year action plans.

The Research Council's proposal for a *new basic funding system for the independent research institute sector* is part of the follow-up to the government white paper *Commitment to Research*, and was presented in October 2006. At the request of the authorities, the Research Council has further refined the proposed system during 2007.

In 2007, the Research Council has drawn up a policy and an action plan for efforts to advance *gender equality and gender perspectives in research*. More focus on the gender dimension is needed to reach the ambitious targets for Norwegian research, including increased recruitment, enhanced quality and wider scope in research activity. The action plan is designed to promote greater gender balance in research and increase knowledge about the impact of gender on various topics and thematic areas that are subject to research.

The Research Council has provided input to a number of reports to the Storting (white papers) and other official reports that touch on research, including the white paper on recruitment and researcher training, the white paper on innovation policy, and the white paper on government reform in which the establishment of regional research funds is proposed.

In its input to the *white paper on innovation policy* the Research Council has emphasised three components in particular: There is a need for long-term instruments that stimulate knowledge investment in industry and promote the transfer of knowledge within the innovation system. There is a need to strengthen infrastructure significantly in order to create satisfactory, efficient and attractive knowledge communities. Public R&D efforts must be increased to promote innovation in companies as well as the public sector, especially within pivotal innovation areas.

In its input to the *white paper on recruitment and researcher training*, the Research Council has stressed the need for increased recruitment and pointed out that quality and capacity in researcher training must be expanded on the basis of a binding long-term plan. The distribution of growth between the various subject fields should be determined on the basis of needs analyses and reflect national research policy objectives as well as the knowledge challenges facing the private and public sectors. The distribution of funding must take into account that high quality researcher training is resource intensive, and requires adequate infrastructure as well as research communities of a certain size. Smaller research environments would therefore be best served by concentrating their training on a smaller number of disciplines and areas.

The Research Council was responsible for drawing up the proposal for *regional research funds* that was presented in the white paper on government reform (*Regionale fortrinn – regional framtid* [Regional advantages – Regional future, Norwegian only]). The Council's proposal was submitted in December 2007 and is being circulated for review as an integral part of the white paper. The proposal to introduce regional research funds is designed to foster greater research activity throughout Norway, strengthen the Research Council's presence in the regions and promote the implementation of targeted instruments to increase R&D investment and interaction between important regional players. The Research Council emphasises that the research must be of high calibre and that funding must be coordinated at the national level. The Research Council seeks an active role in the development and administration of a number of regional research funds, the number of which should be fairly limited. These should be financed through new allocations to avoid any cutbacks in existing national priority areas.

## **International cooperation**

*International research cooperation* has been given priority on the 2007 agenda. The EU has amplified efforts to achieve the pan-European Research Area (ERA). There has also been a general increase in international cooperation between and competition for researchers. In this context, globalisation both provides the potential for greater knowledge and represents a driving force for raising the quality of the Norwegian R&D system.

Thanks to Norway's very active participation in the EU Sixth Framework Programme, the national R&D system has become more internationally oriented and more integrated into European R&D, while the structure has come to reflect the framework programmes to a greater degree. In light of this, the Research Council is drawing up a strategy for participation in the EU Seventh Framework Programme (FP7).

The Research Council seeks to mobilise and encourage the Norwegian R&D system to take part in the FP7 and the building of the European Research Area (ERA). The EU is enhancing and expanding instruments to bring the ERA to fruition, for example through the proposal to strengthen the European Strategy Forum on Research Infrastructures (ESFRI), and to establish a European Institute of Technology (EIT). The Research Council is responsible for formulating the

basis for Norway's viewpoint on the European Commission's *Green Paper on the European Research Area*, and has thus contributed to Norway's success as regards marine and maritime projects.

Norway's participation in *bilateral research cooperation* is on the rise. A total of 128 new bilateral projects were approved in 2007, encompassing cooperation with North America, China, Russia, Japan and India.

The Research Council took the initiative to expand cooperation with North America in 2007. A decision was taken to further adapt the system of stimulation and networking measures, in part to integrate activities into other instruments, and in part to strengthen industry-oriented cooperation. Contact and collaboration with North American research institutions has also been strengthened. In 2007, the Research Council granted funding to 55 new bilateral cooperation projects with the USA and Canada under the system of stimulation measures. In addition, 48 new grants were provided under the Leiv Eiriksson mobility programme, mostly for stays in the USA or Canada as well as visiting research grants for North American researchers.

*Bilateral research cooperation with Japan* in the priority fields of energy and nanotechnology materials is developing at a rapid pace. Cooperation among universities under the Kyoto International Forum for Energy and Environment (KIFEE) is substantial. Both Japan and Norway have indicated a strong interest in the priority field of clean seafood, and it is likely that cooperation will be expanded to include space research as well as polar and climate research. Japan has implemented a fellowship scheme to support Norwegian researchers in Japan. In 2007, Norway launched a corresponding scheme to encourage Japanese researchers to come to Norway. Cooperation agreements have also been signed between Norwegian and Japanese research institutions and universities. The cooperation with Japan has been greatly facilitated by Innovation Norway's local office in Japan.

*Bilateral research cooperation with China* is growing. Efforts to develop a platform for cooperation were launched in 2007, and the Research Council is working together with the Norwegian Ministry of Foreign Affairs on the follow-up relating to research as a priority area under the Government's China Strategy.

A total of 77 projects were granted funding under the system of bilateral stimulation and networking measures. Projects have been implemented across all types of disciplines and research environments. Cooperation with China has gained an additional Nordic dimension through participation in a Noria-Net and annual Nordic conferences held in cooperation with the Chinese Academy of Sciences (CAS). At the European level, cooperation has been enhanced by participation in forums such as the ERA-Net COREACH.

Cooperation with China is being targeted toward three broad-based thematic priority areas: energy, the environment and polar research; hydrology and water resource management; and economics, welfare and regional development. An outline for a 10-year initiative was prepared in 2007 and has been submitted to the relevant parties for discussion.

The *International Polar Year 2007-2008*, which is the largest research initiative in the world, was launched in March 2007. The IPY entails intensive data collection during two summer seasons in the northern and two in the southern polar areas. A total of 50 000 researchers from 63 countries are taking part in the activities, with Norway as one of the major participants. In all, the Norwegian IPY programme is funding 27 research projects involving extensive international cooperation. All of the IPY projects are administered as part of international clusters, and

participation here thus represents an important step forward in the internationalisation of Norwegian research.

### **Research Council as a funding agency**

In 2007 the Research Council allocated a total of NOK 5.2 billion to R&D projects, and processed over 4 000 applications for funding. A total of 68 programmes and activities issued funding announcements.

The research programmes received approximately 2 500 grant proposals for a total of NOK 15.4 billion. Roughly 55 per cent of these were submitted in the fields of mathematics, natural science and technology. Close to half of the proposals were submitted by the university and university college sector, while 35 per cent came from the independent research institute sector.

More than 900 grant proposals for a total of NOK 4.6 billion were submitted for support for independent researcher-initiated projects. The average amount of support per individual overall project period was NOK 5 million. Of the proposals received, 80 per cent were relatively evenly distributed between the humanities, mathematics/natural science and medicine, while six per cent were in technology subjects and 14 per cent were in social science. Close to 80 per cent of the proposals were submitted by the university and university college sector, while 13 per cent came from the independent research institute sector.

As of 1 May, approximately 85 per cent of the funding applications have been fully processed, and 35 per cent have awarded grants. Nearly 14 per cent of the proposals for independent project support have been approved. A large number of projects eligible for funding have had to be rejected due to limited budgetary parameters.

### **Strategic planning, knowledge base and organisation**

A new Research Council Executive Board was appointed and began its activities 1 January 2007. The Minister of Education and Research attended the first board meeting, and in December the Executive Board as a whole met with the Government Committee on Research.

The Executive Board appointed new *division research boards* in 2007. The division research boards were appointed for a four-year term, and the representation reflects the need for many different kinds of expertise and an interface with key user groups. The mandate for the division research boards was revised at the same time to clarify spheres of responsibility and the scientific and strategic principles underlying the research boards' activities, with an eye to promoting cohesiveness within the Research Council and ensuring constructive interaction between the divisions.

The chair of the Executive Board and the Research Council director general have held a number of contact meetings with the political leadership in various ministries, focusing on how the Research Council can further develop in its capacity as an advisor on research policy. The Executive Board is pleased to note that there is significant political support for research and research-related activity, and that research is viewed as an essential component of social and industrial development.

The Executive Board has also started its efforts to revise the Research Council's overall strategy. The current strategy (*Research Expands Frontiers*) was introduced prior to the publication of the white paper *Commitment to Research* in 2005 and before the Government issued its political

platform for a majority government (the Soria Moria Declaration). Both these fundamental documents establish a new set of national priorities. The Board intends to complete the task of devising the new strategy by the summer of 2008.

The Executive Board has attached great importance to improving the knowledge base for efforts involving strategic R&D development, budget proposals and other advisory services. Capacity in these areas has been strengthened substantially. Research on research will also be given more focus in a collaborative effort with the ministries.

During 2007 the Research Council conducted a comprehensive portfolio analysis, mapping out and analysing R&D activities within the structural, thematic and technological priority areas stipulated in *Commitment to Research*. This has provided greater insight into the level of overall activity as well as the coordination of efforts within the individual priority areas. Corresponding data for the overall *national* activity has been compiled by the NIFU STEP Norwegian Institute for Studies in Innovation, Research and Education. These efforts will be continued in 2008. They provide important factual information for use in connection with strategic planning and budgeting, and will thus increase the Council's competence as a strategic advisor.

In the wake of the performance audits conducted by the Office of the Auditor General in 2004 and 2006, the Research Council has implemented a number of measures to ensure better performance management of the programmes and better dissemination of research-related activity. Programme webpages have been established for each programme and guidelines for programme administration have been revised to include more clearly defined requirements for performance targets and management as well as new templates for annual reports and action plans. A new performance management system for the programme boards and division research boards is being planned to ensure closer alignment with the work of the Executive Board and the Research Council's overall strategy.

The Research Council owns a considerable amount of property in the Gaustadbekkdalen area in Oslo. This property has been developed for research purposes in cooperation with the University of Oslo and the Directorate of Public Construction and Property Management (Statsbygg). In recent years, activities in this sphere have decreased as the land area has gradually been utilised and the various development projects implemented. As from 2007, the only tasks that remain involve property management.

### **Results of the year's activities**

The Research Council's revenues totalled NOK 5 900.5 million in 2007. Of this, allocations from the ministries totalled NOK 5 743.6 million. The yield of the Fund for Research and Innovation comprised NOK 940.2 million, and now constitutes the third largest source of revenues.

Operating expenses, including both R&D funds and administrative expenditures, came to NOK 5 917.4 million. The Research Council's net result for 2007 was NOK -10.9 million, including research and administrative obligations. The result after research obligations came to NOK 52.9 million, which will be added to the Research Council's equity and other obligations.

The Research Council has been working systematically to reduce budget transfers from research allocations. A number of measures have been implemented, including long-term programme budgeting and more realistic budgeting at the project level. The positive effects of this were clearly apparent in 2007, although the full impact will not be achieved until 2009. The Research

Council has set, and expects to reach, a target of achieving transfers of less than 15 per cent of the budget for 2009.

### **The working environment – sickness absence**

The Research Council conducted an internal staff survey in 2007. A total of 84 per cent of the staff answered the questionnaire. The results are very similar to the results of the previous survey, which was carried out in 2005. Responses indicate that employees at the Research Council consider it be a good place to work. Elements receiving the highest scores were job satisfaction, co-determination and health and safety.

The total sickness absence is low (3.3 per cent), and has remained at a stable level for several years. The Research Council became an Inclusive Workplace Enterprise after signing a cooperation agreement with the National Insurance Service that took effect on 1 January 2003. This entails among other things that employees on sick leave are followed up more closely than was previously the case. In 2007 there were 29 individuals (7.8 per cent) who had a sickness absence exceeding 10 per cent. Of these, 21 were back to work in either full or part-time activity by the end of the year.

There is a constructive atmosphere of cooperation between management and the employees' associations.

Environmental management perspectives are an integral part of the day-to-day activities. Measures in the areas of energy, transport, waste and procurement have been implemented. The activities of the Research Council do not affect the external environment, nor do they cause emissions that pollute the environment.

### **The employees and gender equality**

As of 31 December 2007, the Research Council's administration consisted of 365.5 man-years/ 371 individuals. Advisers (advisers and senior advisers) comprise the largest group of employees, accounting for a total of 172.3 man-years.

Of the Research Council's 365.5 man-years, 144 (39.4 per cent) are filled by men and 221.5 by women, which means that women account for 61 per cent of the staff. The proportion of women in the executive officer group and the adviser group is quite high, and totals 53 per cent in the combined department director and division director groups.

Women comprise at least 40 per cent of the membership of the Executive Board and the division research boards.

The Research Council's established employment procedures make it mandatory to pay due regard to gender equality considerations. Of 30 appointments in 2007, 63 per cent were women distributed across all job categories, and 10 per cent comprised individuals with immigrant backgrounds. There are ten staff members with immigrant backgrounds in the administration.

### **Challenges**

The goals that have been set for Norwegian research are ambitious. There is an increase in research activity every year. At present, there are more than 30 000 R&D man-years being carried out in Norway, roughly half of which are in trade and industry. However, R&D in the

private sector is not following the pace of economic development. Growth is strongest in the university and university college sector, which will soon reach 10 000 R&D man-years.

The Research Council notes that the objectives for escalation of research activity set out in *Commitment to Research* thus far have not been achieved. Nonetheless, these objectives should continue to set the premises for developments in research investment in Norway, and will form the foundation for the Research Council's growth ambitions. The Research Council has proposed a budget increase of NOK 1.22 billion for 2009. An increase of NOK 15 billion in the capital of the Fund for Research and Innovation is also proposed.

The *Fund for Research and Innovation* was established in 1999 as part of the effort to ensure stable, long-term financing of research activities, safeguard basic research, and facilitate cross-sectoral initiatives among the ministries. The fund has financed much of the growth in public research funding and has given the Research Council the latitude to take strategic action. The fund has been used to finance all the Centres of Excellence and the Centres for Research-based Innovation as well as components of the Large-scale Programmes.

Although the fund's capital has been augmented in recent years, the Research Council has received less of the growth, and the authorities have earmarked a large portion of the yield to finance fixed budget costs. This has diminished the freedom of the Research Council to act, which in turn has a negative impact on the ability to ensure long-term, unified financing of Norwegian research. The use of the fund must be returned to its original intention, which is to support strategic initiatives, and ensure cross-sectoral financing of basic research and more.

As a whole, the Research Council's proposed budget for 2009 sets clearer targets than in previous years. Significant growth is allocated to three main priority areas, which are: *research on renewable energy, environmental technology and climate change; advanced scientific equipment and research infrastructure; and an open, competitive arena for industry-oriented, user-driven research.*

Efforts to strengthen Norwegian research capacity are contingent upon access to adequate human resources and research infrastructure. This will require a substantial increase in the rate of investment in advanced scientific equipment, eInfrastructure, and scientific databases and collections.

The need for personnel with doctoral-level qualifications is expected to rise in all sectors. This will come in addition to the demand for researchers in industry, in the independent research institute sector, and – not least – in the university and university college sector, where individuals are responsible both for conducting research themselves and for supervising and training new researchers. The generational shift that will be taking place in academia in coming years will in itself necessitate a major degree of new recruitment. Almost 300 new fellowship positions need to be established every year from now until 2020 merely to replace the researchers who will be leaving the workforce due to retirement or general attrition. According to report 12/2007 from NIFU STEP, 200 new fellowship positions will be needed each year within MST subjects. In 2007 the number of doctoral dissertations submitted in Norway exceeded 1 000 for the first time ever. Nonetheless, Norway still ranks lower than the other Nordic countries in number of doctoral degrees per capita.

The process of globalisation represents another challenge. Globalisation poses a dilemma for national innovation policy because industrial players are operating across national borders, thereby contributing to the establishment of an international knowledge and research market. For research, international cooperation is essential if we are to increase capacity and enhance quality. New potential emerges, new research environments sprout up at an increasingly rapid pace and what were once barriers between disciplines, institutions and countries are dismantled.

The Research Council is taking active steps to enable Norwegian research to make the most of the opportunities inherent in further developing existing cooperation and opening the door to new ties. We must promote researcher mobility and give Norwegian researchers access to facilities and resources. The Council further seeks to influence the debate in international research policy forums, and to draw greater attention to Norway as an attractive research nation.

It is also essential to increase the utilisation of research findings. The contact between the Executive Board and the political arena has revealed a great need to disseminate research in areas of major political significance. Similarly, it is necessary to improve dissemination activities from the various programme initiatives, and to create a better framework for enhanced commercialisation of research.

### **A thank-you to the staff**

The Executive Board would like to thank the Research Council staff for its effective execution of tasks throughout the year.

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