

Norwegian Roadmap for Research Infrastructure 2010

CONTENTS:

Preface

I. About the Roadmap

1.1 Background and context

1.2 The function of the Roadmap

1.3 Selection of projects for inclusion on the Roadmap

1.3.1. Projects selected for inclusion after assessment of grant proposals under the National Financing Initiative for Research Infrastructure

1.3.2. Decisions at the ministerial level

1.3.3. Projects on the European Roadmap for Research Infrastructures

1.4 Updating the Roadmap

2. Research infrastructures included on the Roadmap

2.1 Projects included on the first edition of the Roadmap

2.2 Projects on the European Roadmap for Research Infrastructures

2.3 Research areas of national priority

PREFACE

The Norwegian Roadmap for Research Infrastructure corresponds closely to similar national roadmaps that have been, or are being, drawn up in many other European countries. The Norwegian Roadmap is a direct follow-up of the Government white paper on research, Climate for Research, and is closely linked to the National Financing Initiative for Research Infrastructure which had its first call for proposals in 2009.

The Roadmap is designed to identify major research infrastructures that are essential for achieving research policy objectives, solving major societal challenges and laying the foundation for new knowledge. The Roadmap will be a planning tool for long-term investment in this type of infrastructure.

In this first edition of the Roadmap the Research Council has chosen to focus on the large-scale projects for the announcement in 2009 which was rated as the best, both from a scientific evaluation carried out by international experts and from national research strategic considerations.

Only 17 projects passed the strict quality requirements that were assumed. Only nine of these applications were granted at the first assignment. The Research Council considers all the projects on the roadmap as thoroughly examined and quality assured, and investment ready. The Roadmap also provides a guide to public and private funders of research infrastructure.

The Roadmap seeks to highlight Norwegian participation in international research infrastructures. It therefore includes six projects on the European Strategy Forum on Research Infrastructures' (ESFRI) European Roadmap for Research Infrastructures in which Norway has entered into binding agreements or has clearly signalled its desire to participate.

The Research Council of Norway hopes that the initial version of the Norwegian Roadmap for Research Infrastructure will provide a constructive overview of the Norwegian research infrastructure under development and will prove useful to the Government, research institutions and international partners in collaboration. The Roadmap will be updated after each major announcement of funding for research infrastructure, the first time in mid-2011.

I. About the Roadmap

1.1 Background and context

It is widely recognised that large-scale equipment facilities, scientific databases and collections, and electronic infrastructure (eInfrastructure) are crucial if the research sector is to supply the knowledge society requires. Nor is there any doubt that there is a need for substantial investment in this type of research infrastructure. National investment needs are estimated at NOK 11 billion for the period 2008-2017. This does not include operating costs.

Norway's national strategy for research infrastructure, Tools for Research, was published in 2008. The strategy was rapidly followed up by the Government's initiative to set aside earmarked funding for research infrastructure from the Fund for Research and Innovation. The National Financing Initiative for Research Infrastructure was launched, and a funding announcement for an initial NOK 500 million was issued in 2009.

The Government white paper on research, Climate for Research, assigns the Research Council the responsibility for drawing up a Norwegian roadmap for investment in research infrastructure. The Roadmap is to present national and international large-scale projects in which the Research Council recommends investing in the near future – within a realistic budget framework. The white paper stipulates that research infrastructure investments to be included on the roadmap must be selected on the basis of stringent criteria in terms of quality as well as relevance and benefit to society.

The Roadmap presented here is a direct follow-up of the white paper on research and is closely linked to the National Financing Initiative for Research Infrastructure. It also follows up the strategy Tools for Research.

The Norwegian Roadmap corresponds closely to similar national roadmaps that have been, or are being, drawn up in many other European countries. Together with the European Strategy Forum on Research Infrastructures' (ESFRI) European Roadmap for Research Infrastructures, the national roadmaps will help to clarify needs and interests when establishing common European priorities for important, large-scale, internationally-oriented infrastructures.

1.2 The function of the Roadmap

The Roadmap will:

- identify major research infrastructures that are essential for achieving research policy objectives;
- be used for long-term planning of investment in large-scale research infrastructure;
- provide a guide for public and private funders of research infrastructure in that it presents projects that are fully prepared, quality assured and investment-ready, but are in need of full or partial funding;
- be incorporated into the toolbox employed by the Research Council for determining how to target future funding announcements for research infrastructure to ensure, among other things, optimal utilisation of investments;

- give a higher profile to Norwegian participation in international research infrastructures and show the balance and proportionality between such participation and national investments.

1.3 Selection of projects for inclusion on the Roadmap

Projects will be included on the Roadmap as the result of one of three processes.

1.3.1. Projects selected for inclusion after assessment of grant proposals under the National Financing Initiative for Research Infrastructure

Projects submitted for the first funding round under the National Financing Initiative for Research Infrastructure that fulfilled the three criteria described below have been included on the Roadmap. A total of 17 projects were qualified.

Criterion 1: The infrastructure is nationally-oriented

The National Financing Initiative for Research Infrastructure only allocates funding to nationally-oriented projects. This is defined as:

Infrastructure that is of widespread national interest

The establishment of the infrastructure must be of major interest to Norway as a whole. The Research Council will incorporate considerations relating to the priorities set out in the white paper on research.

Infrastructure that will be available in only one or a few locations in Norway, as a general rule

The Research Council encourages research institutions with common interests to implement task-sharing when appropriate and work together on grant applications.

Infrastructure that lays a foundation for internationally cutting-edge research

Allocations are intended to support the activities of research groups that are already at the international forefront or demonstrate good potential realistically speaking to achieve that position.

Infrastructure that will be made accessible to relevant researchers and industries

Access must be given to any groups outside the applicant institution that will need to utilise the infrastructure. Grant applications must include plans for user access.

Criterion 2: The project involves large-scale research infrastructure

The National Financing Initiative for Research Infrastructure deals with grant proposals for projects with investment costs in the range of NOK 2-200 million. With regard to large-scale laboratories and equipment components, grant applications must exceed NOK 30 million to be qualified for consideration as "large-scale infrastructure". This amount applies to the Research Council's portion of the total investment costs for the establishment of the infrastructure. Costs related to construction, operation and maintenance are not included in this amount.

For important national infrastructures that are not connected to large-scale laboratories and equipment components, a limit of somewhat less than NOK 30 million may be applied. These include, for example, eInfrastructure and databases of a unique nature or broad national application.

Criterion 3: The grant proposal has been assessed as outstanding, both in terms of scientific merit and strategic orientation

The projects that have been included on the roadmap have received the mark of "Outstanding" after a thorough scientific review by international referees. They have also been reviewed by the Research Council and have been deemed to be of major strategic importance for Norwegian research.

1.3.2. Decisions at the ministerial level

Decisions regarding research infrastructure involving investments that exceed NOK 200 million will be taken at the ministerial level, based on recommendations from the Research Council. After consultation with the Ministry of Research and Education, research infrastructure of this magnitude may be included on the roadmap, provided that the project has been reviewed and assessed as having high scientific merit and strategic value. No projects of this type have been included on the initial version of the Roadmap.

1.3.3. Projects on the European Roadmap for Research Infrastructures

The Norwegian roadmap includes projects on the European Roadmap for Research Infrastructures in which Norway has entered into binding agreements or has clearly signalled its desire to participate. Norwegian research groups are participating in the preparatory phase for these six projects. All the projects have undergone a thorough review by ESFRI and are also considered to be of major strategic importance for Norwegian research. None of the projects had come far enough in their planning process for the Norwegian research groups to seek funding from the Research Council in the first funding round under the National Financing Initiative for Research Infrastructure (in 2009).

Once the scope, orientation and international task-sharing have been specified for these projects, the Norwegian research groups that wish to participate must submit a proposal under the National Financing Initiative for Research Infrastructure. These proposals will be subject to the same assessment of scientific merit and strategic importance as a nationally-oriented project.

The Norwegian Roadmap will not include national pre-projects or projects associated with Preparatory Phase projects on the European Roadmap for Research Infrastructures.

1.4 Updating the Roadmap

The white paper on research, *Climate for Research*, stipulates that the Roadmap is to be updated in the wake of each major funding announcement for research infrastructure.

An updated Roadmap will therefore be published in 2011. The Research Council is working to incorporate an update of the strategy *Tools for Research* in the Roadmap at that time.

Due to the constraints of the financial framework and the rigorous prioritisation process, the Roadmap will only include a limited number of projects at any given time. An update of the Roadmap subsequent to new funding announcements may result in the deletion of some of the projects listed there, to maintain a balance between national priority research areas, for example, or because they have been on the roadmap for a significant length of time without receiving funding.

In connection with new funding announcements issued under the National Financing Initiative for Research Infrastructure, projects on the Roadmap may submit a revised proposal to update their project descriptions or make minor adjustments to their cost and funding plans or introduce administrative changes. A new grant proposal must be submitted if there have been major changes in scientific content or investment costs.

Projects that have been included on the Roadmap but have not received funding will be given no intrinsic advantage over other projects during new funding rounds. Proposals for these projects must compete for funding on an equal footing with grant proposals for new projects. This will ensure that priority is always given to the best projects when allocating grant awards and that adequate consideration is given to new needs and political priorities that may have emerged during the interval between funding announcements.

2. Research infrastructures included on the Roadmap

The Roadmap presented here contains 23 projects.

Seventeen of the projects have their origin in grant proposals submitted in response to the initial funding announcement issued by the National Financing Initiative for Research Infrastructure in 2009. These were selected from among 260 grant proposals after thorough assessment on the basis of the criteria described in Section 1.3.1. Ten of these projects received full or partial grant awards and have signed a contract, or are engaged in contract negotiations, with the Research Council.

The budget framework of the funding announcement was insufficient for financing of the remaining seven projects, despite the fact that they earned a mark of "Outstanding" in terms of scientific merit and strategic importance. These projects are considered to be investment-ready.

The other six projects presented here are projects on the European Roadmap for Research Infrastructures in which Norway has entered into binding agreements or has clearly signalled its desire to participate.

An effort has been made to ensure that projects on the Norwegian roadmap represent a balance between national priority research areas. The figure below shows the total amount of funding sought by the projects on the Roadmap under the National Financing Initiative for Research Infrastructure in 2009 distributed by:

- the priority thematic areas and technologies identified in the Government white paper on research;
- eInfrastructure of benefit to all disciplines;
- projects of particular relevance to basic research.

Although the majority of infrastructures on the Roadmap have wide-ranging areas of application, Figure 1 gives only the area in which the project has its primary objective. Nevertheless, the figure clearly illustrates that there are funded or investment-ready projects in almost all of the national priority research areas.

2.1 Projects included on the first edition of the Roadmap

Table 1:

Large-scale Facilities					
Project	Topic	Applicants	Amount sought mill NOK	Amount allocated mill NOK	Status
NMNF Norwegian Micro- and Nanofabrication Facilities	Materials and Nanotechnology	NTNU, SINTEF, UiO, HVE	150	71	Under implementation
NOWERI Norwegian Offshore Wind Energy Research Infrastructure	Energy	CMR, SINTEF	77	66	Under implementation
Biobank Norway A national infrastructure for biobanks and biobank related activity in Norway*	Health and Biotechnology	NTNU, UiT, UiO, UiB, FHI, Helseforetakene	96	80	Under implementation
NORTEM The Norwegian Centre for Transmission Electron Microscopy	Materials and Nanotechnology	SINTEF, NTNU, UiO	98		Investment ready
MARINTEK The marine technology laboratories. Required upgrading and developments	Oceans	SINTEF Marintek, NTNU	162		Investment ready
GEOTESTING National Geo-Test Sites	Geosciences	NGI, NTNU, UNIS, SINTEF	48		Investment ready
NORBRAIN Norwegian brain initiative: a large-scale infrastructure for 21st century neuroscience	Health	NTNU, UiO	174		Investment ready
NorMIT Norwegian centre for minimally invasive image guided therapy and medical technologies	Health and Biotechnology	St. Olavs Hospital, NTNU, SINTEF, UiO, IVS Oslo University Hospital	103		Investment ready

* The project is expected to partly finance the Norwegian node in the ESFRI-project BBMRI – Biobanking and Biomolecular Resources Research Infrastructure.

Table 2:

eInfrastructure					
Project	Topic	Applicants	Amount sought mill NOK	Amount allocated mill NOK	Status
NorStore Norwegian data storage infrastructure	Interdisciplinary	UNINETT Sigma AS	43	37	Funding allocated for 2010-2013
Notur II The Norwegian metacenter for computational science	Interdisciplinary	UNINETT Sigma AS	40		Investment ready
SEQ An eInfrastructure supporting high-throughput sequencing in life sciences	Biotechnology	UiB, UiO, NTNU, UiT	45		Investment ready

Table 3:

Scientific Databases and Collections					
Project	Topics	Applicants	Amount sought mill NOK	Amount allocated	Status
MENOTEC Medieval Norwegian text corpus	Humanities	UiO, UiB	7,3	7	Under implementation
INESS Infrastructure for the exploration of syntax and semantics	Humanities	UiB, UNI Research AS	22	19	Under implementation
NORMAP Norwegian satellite earth observation database for marine and polar research	Geophysics	NERSC, CERSAT, Kongsberg Satellite Services, The Norwegian Meteorological Institute	33	25	Under implementation
ACDC Advanced Conflict Data Catalogue: defining an industry-standard for data on armed conflict	Social Sciences	PRIO, Swiss Fed. Inst. of Technology, ETH, Uppsala university	8,8	8	Under implementation
The ACCESS life-course database	Social Sciences	NOVA, SSB	6,6	6	Under implementation
NorBOL Norwegian Barcode of Life Network	Biology	UiO, Bergen Museum, UiTØ, Museum of Natural History and Archeology	27		Investment ready

2.2 Projects on the European Roadmap for Research Infrastructures

- in which Norway has entered into binding agreements or has clearly signalled its desire to participate.

Table 4:

ESFRI: Large-scale Facilities			
Project	Topic	Norway offers hosting	Participating Norwegian institutions
SIOS The Svalbard Integrated Arctic Earth Observing System	Climate and Environment	X	RCN, NPI, UNIS, NSC, UiB, UiT, METNO, NERSC, IMR, NILU, NMA, ARR
ESRF Upgrade European Synchrotron Radiation Facility*	Materials Science		NordSync (Norway, Sweden, Denmark, Finland)
ECCSEL European Carbon Dioxide Capture and Storage Laboratory Infrastructure	Carbon Capture and Storage, Energy	X	NTNU, SINTEF
ESS European Spallation Source	Physics, Materials Science		IFE, NTNU, UiO, UiB
EISCAT-3D Next Generation European Incoherent Scatter Radar System*	Physics, Space Research		UiT, UNIS, UiO, UiB og FFI

* Norway is member of ESRF and EISCAT

Table 5:

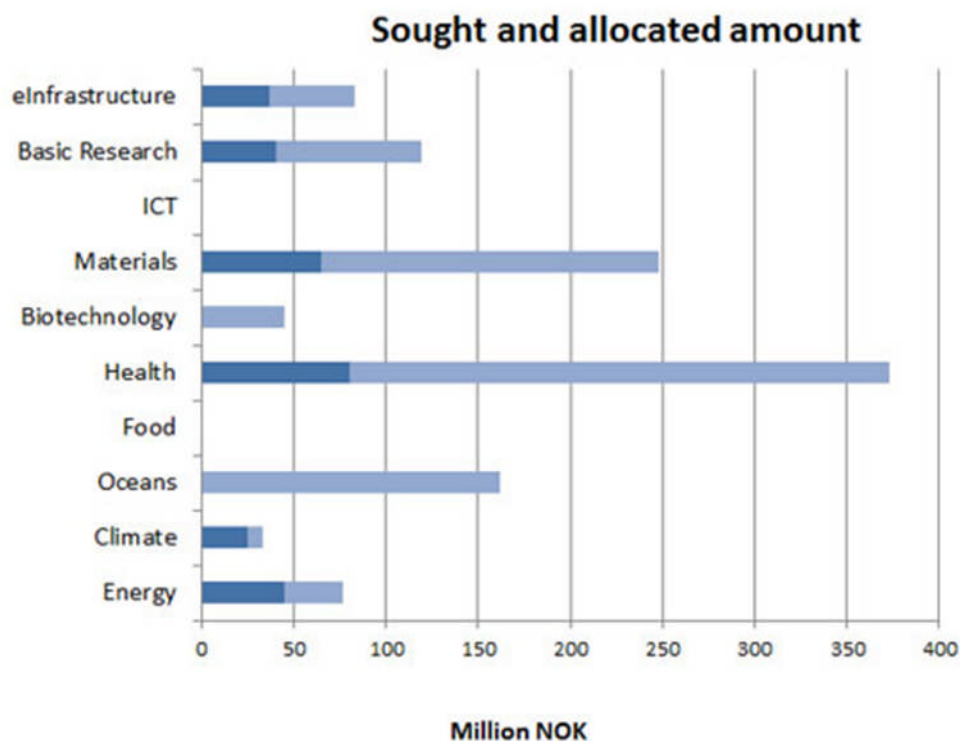
ESFRI: Scientific Databases and Collections			
Project	Topic	Norway offers hosting	Participating Norwegian Institutions
CESSDA Council of European Social Science Data Archives	Social Sciences	X	Norwegian Social Science Data Service(NSD)

2.3 Research areas of national priority

An effort has been made to ensure that projects on the Norwegian roadmap represent a balance between national priority research areas. The figure below shows the total amount of funding sought by the projects on the Roadmap under the National Financing Initiative for Research Infrastructure in 2009 distributed by:

- the priority thematic areas and technologies identified in the Government white paper on research;
- eInfrastructure of benefit to all disciplines;
- projects of particular relevance to basic research.

Although the majority of infrastructures on the Roadmap have wide-ranging areas of application, the figure below gives only the area in which the project has its *primary objective*. Nevertheless, the figure clearly illustrates that there are funded or investment-ready projects in almost all of the national priority research areas.



The total amount sought by projects in roadmap tables 1, 2 and 3 above, distributed by the thematic priority areas and technologies identified in the white paper on research, eInfrastructure (of an interdisciplinary nature) and basic research. Allocated sums and sums under negotiation are indicated in the dark portion of the horizontal bar