

Tools for Research – Part II

Norwegian Roadmap for Research Infrastructure 2012

About the Research Council of Norway

The Research Council of Norway is Norway's national strategic research planning and funding agency. The Research Council is the central advisory body on research policy to the Government, the ministries, and other key institutions and environments affiliated with research and development (R&D) activities. The Council also works to increase allocations to, and the quality of, R&D in Norway as well as to promote innovation in cooperation with the research community, trade and industry, and the public administration. The Research Council is responsible for identifying research needs and recommending national priority areas. Through the establishment and implementation of targeted funding schemes the Council facilitates the translation of national research policy objectives into action. Other key tasks are to serve as a meeting place for researchers, funders and users of research findings and to advance the internationalisation of Norwegian research.

Contents

Preface.....	3
About the roadmap	4
Background.....	4
The function of the roadmap	4
Selection of projects for inclusion on the roadmap	4
Research Council assessment of roadmap projects	5
Updating the roadmap	6
Strategic basis.....	7
Roadmap projects	8

Preface

The first version of the Norwegian Roadmap for Research Infrastructure was published in 2010, as one of many similar roadmaps that had been, or were in the process of being, drawn up in other countries. The roadmap presented large-scale projects of national importance that had achieved very high ranking in the first funding round in 2009. The roadmap is to be revised after each major funding announcement for research infrastructure issued by the Research Council. This printed document is the roadmap after it was updated following the second funding round in 2010. The projects presented here have either already received funding or are deemed “investment-ready” by the Research Council. They are referred to in this document as “roadmap projects”. The roadmap supports the recommendations set out in *Tools for Research – Part I* of increasing the investment volume in, and ensuring long-term funding of, research infrastructure in the years to come.

The Norwegian-language version of the roadmap outlines in more detail the strategic basis for the Research Council’s thinking and priority-setting with regard to research infrastructure in specific disciplines, thematic areas and technology areas. The roadmap projects are presented there in individual chapters describing the research objectives, existing infrastructure and need for infrastructure in the respective areas.

The roadmap is not meant to be a static document, and it will be revised in the wake of each major funding announcement. New projects may be added, while others that have been listed on two consecutive editions of the roadmap without receiving funding will be removed and must submit a new grant proposal in the next funding round. The strategic basis underlying the Research Council’s orientation in relation to the roadmap is open to discussion and continually evolving. For this reason, the most recent electronic version of the roadmap, available at www.forskingsradet.no/veikart, will be the valid version at any given time.

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Director General of the Research Council of Norway

About the roadmap

Background

The Government white paper on research, *Climate for Research* (2008-2009), 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 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;
- > display Norwegian participation in international research infrastructures and show the balance and proportionality between such participation and national investments.

Selection of projects for inclusion on the roadmap

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

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

In the wake of each major funding announcement under the National Financing Initiative for Research Infrastructure, the Research Council administration will assess which projects to highlight via inclusion on the roadmap. After the first two funding announcements, a total of 38 projects have been selected for inclusion on the roadmap on the basis of their scientific merit and strategic importance. Some of these have already received funding. Three criteria are applied when projects are considered for inclusion on the roadmap:

Criterion 1: The infrastructure is nationally-oriented

The National Financing Initiative for Research Infrastructure only allocates funding to nationally-oriented projects. These are defined as (refer to *Tools for Research – Part I* for a more detailed description of terminology):

- Infrastructure that is of widespread national interest
- Infrastructure that will be available in only one or a few locations in Norway, as a general rule
- Infrastructure that lays a foundation for internationally cutting-edge research
- Infrastructure that will be made accessible to relevant researchers and industries

Criterion 2: 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.

Criterion 3: The project involves a large-scale, comprehensive research infrastructure

To be considered for inclusion on the roadmap, a project must not only be of great national importance, but must also entail a high investment level compared to other research infrastructures within the respective field.

Decisions at the ministerial level

After consultation with the Ministry of Research and Education, research infrastructure involving investments that exceed NOK 200 million may be included on the roadmap, provided that the project proposal has been reviewed and assessed as having high scientific merit and strategic value. After the first two calls for proposals, no projects of this type have been included on the roadmap as yet.

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. All such projects have undergone a thorough review by the European Strategy Forum on Research Infrastructures (ESFRI) and are also considered by the Research Council to be of major strategic importance for Norwegian research. These projects are in various phases of planning and implementation; those that have received funding from the Research Council have been assessed on an equal footing with other projects under the National Financing Initiative for Research Infrastructure.

Research Council assessment of roadmap projects

During new funding rounds, investment-ready projects included on the roadmap are considered “completed” grant proposals. They will not, however, be given any intrinsic advantage over other projects and must compete for funding on a level playing field with proposals for new projects. This will ensure that priority is always given to the projects of highest merit and strategic value when allocating grant awards. It will also allow adequate consideration to be given to new needs and political priorities that may have emerged during the interval between funding announcements.

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.

Updating the roadmap

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 removal 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. Projects that have been listed on two consecutive editions of the roadmap without receiving funding must submit a new grant proposal in the next funding round.

Strategic basis

The following tables provide an introductory overview of the projects on the Norwegian roadmap. Projects on the ESFRI Roadmap that are of interest to Norway are presented in a separate table. This English version of *Tools for Research – Part II* is an abridged translation. The Norwegian document contains project descriptions and greater detail about Norway's infrastructure needs and the strategic priorities that form the basis for allocations to the Research Council budget and the planning of future funding announcements for research infrastructure.

Projects selected for the roadmap after Research Council assessment of grant proposals

Large-scale equipment facilities

Project	Applicant and project partners	Funding sought, in NOK	Funding amount, in NOK	Status
NORBRAIN Norwegian Brain Initiative: a Large-scale Infrastructure for 21st Century Neuroscience	Norwegian University of Science and Technology (NTNU), University of Oslo (UiO)	96 million	80 million*	Under implementation
Biobank Norway A National Infrastructure for Biobanks and Biobank Related Activity in Norway	NTNU, University of Tromsø (UiT), UiO, University of Bergen (UiB), Norwegian Institute of Public Health (FHI), Norway's four Regional Health Authorities	96 million	80 million	Operational
NorMIT Norwegian Centre for Minimally Invasive Image Guided Therapy and Medical Technologies	St. Olavs Hospital, NTNU, SINTEF, UiO, Oslo University Hospital	107.6 million		Investment-ready
Pilot Plant Pilot Plant Facilities for Food Processing at Campus Ås	Norwegian University of Life Sciences (UMB), Norwegian Institute of Food, Fisheries and Aquaculture Research (Nofima)	32 million	27 million	Under implementation
NorARGO A Norwegian Argo Infrastructure – a part of the European and Global Argo Infrastructure	Havbruksinstituttet (HI)	16.6 million	4 million*	Under implementation
NORMAR Norwegian Marine Robotics Facility – Remotely Operated Vehicle for Deep Marine Research	UiB, HI, Christian Michelsen Research (CMR)	33.5 million		Investment-ready
MARINTEK The Marine Technology Laboratories. Required upgrading and developments	SINTEF / Norwegian Marine Technology Research Institute (MARINTEK), NTNU	174 million		Investment-ready
ULLRIGG Upgrade of Ullrigg	International Research Institute of Stavanger (IRIS)	67.2 million	40 million*	Under implementation
NOWERI Norwegian Offshore Wind Energy Research Infrastructure	CMR, SINTEF Energy Research, Institute for Energy Technology (IFE), NTNU	77.2 million	66 million*	Under implementation
AMFM Advanced Multiphase Flow Measurement	IFE, NTNU, UiO, SINTEF Petroleum Research, Statoil, SPT Group, Imperial College	67.7 million		Investment-ready
MFL Multiphase Flow Lab	SINTEF Petroleum Research, IFE, IRIS, NTNU, Fabricom, NATCO Norway	42.2 million		Investment-ready
NSST Norwegian Laboratory for Silicon-based Solar Cell Technology	SINTEF, NTNU, UiO, IFE	38.5 million		Investment-ready
NORTEM The Norwegian Centre for Transmission Electron Microscopy	SINTEF, NTNU, UiO	98.1 million	58 million*	Under implementation
NorFab Norwegian Micro- and Nano-fabrication Facilities	NTNU, SINTEF, UiO, Vestfold University College (HiVe)	150 million	71 million	Operational
GEOTESTING National Geo-Test Sites	Norwegian Geotechnical Institute (NGI), NTNU, University Centre in Svalbard (UNIS), SINTEF, Norwegian Public Roads	48 million		Investment-ready

* Funding amount has not yet been finalised.

eInfrastructure

Project	Applicant and project partners	Funding sought, in NOK	Funding amount, in NOK	Status
NorStore Norwegian Data Storage Infrastructure	UNINETT Sigma AS, NTNU, UiB, UiO, UiT	43.5 million	37 million	Operational
Notur II The Norwegian Metacenter for Computational Science	UNINETT Sigma AS, NTNU, UiB, UiO, UiT	40 million	40 million	Under implementation
PRACE Partnership for Advanced Computing in Europe	UNINETT Sigma AS, NTNU, UiO	13.1 million	8 million	Operational
ELIXIR.NO a Norwegian ELIXIR Node	UiB, UiO, NTNU, UiT, UMB	70 million	50 million*	Under implementation

* Funding amount has not yet been finalised.

Scientific databases and collections

Project	Applicant and project partners	Funding sought, in NOK	Funding amount, in NOK	Status
MENOTEC Medieval Norwegian Text Corpus	UiO, UiB	7.3 million	7 million	Under implementation
INESS Infrastructure for the Exploration of Syntax and Semantics	UiB, UNI Research AS, UiO, UiT, National Library of Norway, UNINETT Sigma, Kunnskapsforlaget, Microsoft	22.4 million	19 million	Under implementation
CLARINO Common Language Resources and Technology Infrastructure Norway	UiB, UiO, Norwegian School of Economics and Business Administration (NHH), UiT, NTNU, UNI Research AS	26 million	25 million*	Under implementation
LIA Language Infrastructure made Accessible	UiO, UiT, UiB, NTNU, National Library of Norway, Humboldt-Universität zu Berlin, University of Wisconsin-Madison	29.8 million		Investment-ready
The ACCESS Life-course Database	Norwegian Social Research (NOVA) , Statistics Norway (SSB)	6.6 million	6 million	Under implementation
ACDC Advanced Conflict Data Catalogue	International Peace Research Institute, Oslo (PRIO) , Swiss Federal Institute of Technology (ETH), Uppsala University	8.8 million	8 million	Under implementation
RAIRD Remote Access Infrastructure for Register Data	Norwegian Social Science Data Services AS (NSD) , SSB	43.9 million	35 million*	Under implementation
ESS Norwegian Membership and Participation in the European Social Survey	NSD	16.2 million	10 million*	Under implementation
HISTREG National Historical Population Register for Norway 1800-2020 (HPR)	UiT, National Archives of Norway, SSB, NR, NLI, Volda University College, FHI, University of Stavanger (UiS), UiB, Snøhetta Forlag	35 million		Investment-ready
HELSEREGISTERE Health Registries for Research	UiB, FHI, UiT, NTNU, Norwegian Directorate of Health, Norwegian Knowledge Centre for the Health Services, Northern Norway Regional Health Authority	56.5 million		Investment-ready
NORMAP Norwegian Satellite Earth Observation Database for Marine and Polar Research	Nansen Environmental and Remote Sensing Center (NERSC) , Center for Satellite Exploitation and Research (CERSAT), Kongsberg Satellite Services, Norwegian Meteorological Institute (Met.no)	33 million	25 million	Under implementation
NMD Norwegian Marine Data Centre	HI, NTNU, CMR, FFI, University of Nordland (UiN), Met.no, NERSC, Geological Survey of Norway (NGU), Norwegian Institute for Nature Research (NINA), Norwegian Polar Institute, Norwegian Mapping and Cadastre Authority, UiB, UiO, UiT, Norwegian Institute for Water Research (NIVA), Akvaplan NIVA, UNI Research AS	74 million	48 million*	Under implementation
NorBOL Norwegian Barcode of Life Network	Museum of Natural History and Archaeology at NTNU , Natural History Museum of UiO, Bergen Museum at UiB, Tromsø University Museum, Biodiversity Institute of Ontario	28.1 million		Investment-ready

* Funding amount has not yet been finalised.

Projects on the ESFRI Roadmap in which Norway has entered into binding agreements or has clearly signalled its desire to participate

ESFRI project
Social sciences and humanities
* CESSDA Council of European Social Science Data Archives
** ESS European Social Survey
** CLARIN Common Language Resources and Technology Infrastructure
Environmental sciences
*** EISCAT_3D European Next Generation Incoherent Scatter Radar
** EuroARGO European Argo Infrastructure
* SIOS The Svalbard Integrated Arctic Earth Observing System
Energy
* ECCSEL European Carbon Dioxide Capture and Storage Laboratory Infrastructure
Biological and medical science
** BBMRI Biobanking and Biomolecular Resources Research Infrastructure
**** ELIXIR European Life Sciences Infrastructure for Biological Information
Material and analytical facilities & physical and engineering sciences
* ESRF Upgrade European Synchrotron Radiation Facility Upgrade
* ESS Lund European Spallation Source
e-Infrastructure
**** PRACE Partnership for Advanced Computing in Europe

The table above provides an overview of all projects that are included on both the Norwegian and the ESFRI Roadmap, where Norway has interests in the pan-European project. For the current phase/status of the various international projects, refer to the ESFRI Roadmap (ec.europa.eu/research/esfri/).

The projects are annotated as follows:

* The political decision has been taken for Norway to participate in the project.

** Norwegian participation in the project has not yet been determined at the political level.

*** Discussion at the political level of whether Norway should participate in the project depends on whether the project will be carried out by an organisation of which Norway is a member.

**** The Research Council has awarded funding to a Norwegian project that may come to comprise a node within the ESFRI project. The pan-European cooperation has not yet been defined sufficiently to warrant recommending Norwegian membership.

Norwegian institutions are also participating in the Preparatory Phase of the following projects on the ESFRI Roadmap:

- > **ANAEE** Infrastructure for Analysis and Experimentation on Ecosystems
- > **EATRIS** European Advanced Translational Research Infrastructure in Medicine
- > **ECRIN** Pan-European Infrastructure for clinical trials and biotherapy
- > **EMBRC** European Marine Biological Resource Centre
- > **EMSO** European Multidisciplinary Seafloor Observatory
- > **EPOS** European Plate Observing System
- > **ERICON AB** European Research Icebreaker
- > **EuroBioImaging** Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences
- > **EU-OPENSREEN** European Infrastructure of Open Screening Platforms for Chemical Biology
- > **ICOS** Integrated Carbon Observation System
- > **LIFEWATCH** Science and Technology Infrastructure for Biodiversity Data and Observatories
- > **WINDSCANNER** The European Windscanner Facility