https://www.forskningsradet.no/en/financing/what/infrastructure/veikart-for-forskningsinfrastruktur/guidelines/?downloadChapter=true

Norwegian Roadmap for Research Infrastructure 2023

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Part 1: Research Council funding of research infrastructure – guidelines and recommendations

Goal

The Research Council of Norway's funding of research infrastructure (INFRASTRUKTUR) forms the basis for the following mair objectives:

- The Research Council will focus its efforts on achieving relevant, updated and broadly available research infrastructure

Background

Over the past 10-15 years, there have been major changes in the funding of national research infrastructure. The Government's long-term plan for research and higher education for the period 2015–2024 made it clear that the best researchers and students should have access to world-class research infrastructure, and that funding of infrastructure should be strengthened based on strategic assessments and priorities. Since then, the Government has followed up an ambitious and predictable escalation plan with an increase in the annual allocations to research infrastructure, so that the National Financing Initiative for Research Infrastructure now (2023) has an annual budget of approximately NOK 800 million. The need for and importance of access to research infrastructure are also highlighted in the new long-term plan for 2023–2032.

The National Financing Initiative for Research Infrastructure was established in 2009 as part of the follow-up of the white paper Klima for forskning ("Climate for Research") and the Research Council of Norway's strategy "Verktøy for forskning – Nasjonal strategi for forskningsinfrastruktur". The National Financing Initiative for Research Infrastructure is funded by the Ministry of Education and Research and is intended to contribute to a well-functioning research system that delivers high-quality research, develops knowledge to meet key challenges in society and the business sector, contributes to dynamics and interaction nationally and internationally, and facilitates learning, application and innovation. In addition, funding of high-quality research infrastructure must support increased internationalisation and recruitment.

The National Financing Initiative for Research Infrastructure is intended to give Norwegian research access to infrastructures th are necessary at any given time to:

- conduct research of high international quality
- achieve a high degree of institutional cooperation and division of labour at the national level
- increase international cooperation
- achieve access to the use and reuse of FAIR research data

The international FAIR principles for good facilitation and accessibility of research data

The international FAIR principles have been developed as a set of guidelines to facilitate increased data value and further use of research data. FAIR is an acronym for the words *findable, accessible, interoperable and reusable*. In other words, research data must be of a quality that makes them accessible, retrievable and reusable. Furthermore, data and metadata should be machine-manageable, and consistent vocabulary should be used.

Source: Wilkinson, Mark D. et al. (2016) "The FAIR Guiding Principles for scientific data management and stewardship". Scientific Data.3

See also: https://www.force11.org/group/fairgroup/fairprinciples

Knowledge needs

Research contributes to the development of knowledge to meet key challenges in society and business6. With access to good, up-to-date tools, research groups can meet societal needs for increased sustainability and more innovation and restructuring through high-quality research and efficiency. Updated infrastructure facilitates that researchers from different disciplines utilise the infrastructure and collaborate in interdisciplinary projects. Business competitiveness is increasingly built on expertise and technology developed in close cooperation with internationally leading academic environments with access to modern researcl

facilities. The development of public sector services in Norway also requires high-level research.

Attractiveness and efficiency

The right tools are needed to ensure targeted and effective work. This is also the case in research. Modern and up-to-date research infrastructure contributes to high quality in Norwegian research and facilitates collaboration with the best international research groups, while at the same time inspiring good students to pursue a research career. Up-to-date research infrastructure combined with good researchers, is also important for the effective implementation of innovation projects in industry and public administration, and may encourage Norwegian and foreign companies to choose to organise their research activities in Norway

International cooperation on research infrastructures

Participation in international research organisations gives Norwegian researchers access to research infrastructures and the opportunity to participate in innovative and resource-intensive research that would be impossible to achieve with national fundin alone. This may be important in order to safeguard and further develop national expertise in subject and technology areas where is not obvious that Norway should have a leading role with regard to the establishment of research infrastructure. Participation also provides considerable potential for technology transfer and development of Norwegian industry. National research infrastructures also help to make Norwegian research groups attractive partners for international projects (e.g. increased opportunities under Horizon Europe) and for Norwegian and international companies. At the same time, a cost-benefit assessment must be made of membership in major new international research infrastructures and of the need to maintain existir membership.

More information about the international research infrastructures Norway participate is provided in part 3 of the roadmap.

ESFRI's roadmap and Norwegian participation

The European Strategy Forum on Research Infrastructures (ESFRI) was established in 2002 by the research ministers of the EU as an advisory forum for research infrastructure. ESFRI has participants from all member states and from associated countries t the EU Framework Programme for Research and works for pan-European policy development and cooperation on investments and operation of research infrastructures. ESFRI develops a strategic roadmap on Europe's need for new or upgraded research infrastructure in most research areas. ESFRI also prepares landscape analyses in its roadmaps describing the national and international research infrastructures that are established and open to European researchers and industry actors. This thus constitutes an important knowledge base for where there are good opportunities for Norwegian research groups to initiate international cooperation related to existing or future research infrastructures. ESFRI published its latest roadmap in September 2021.

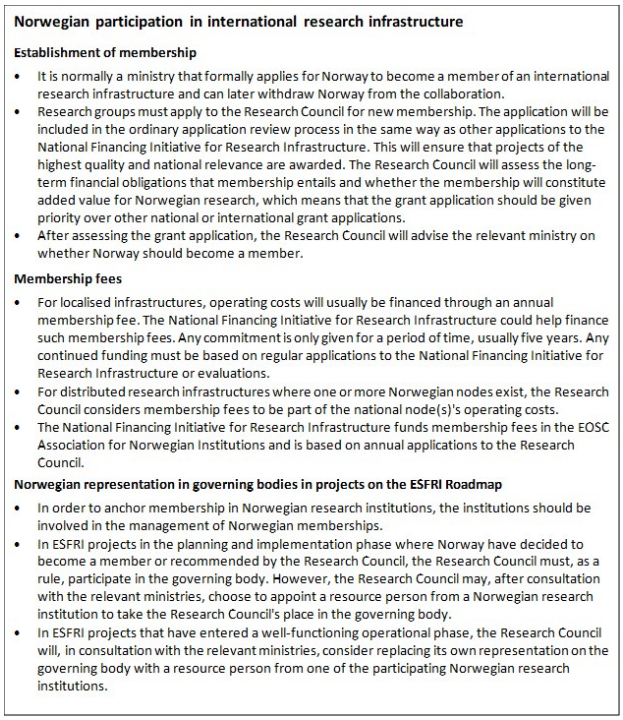
Localized or distributed research infrastructure.

Research infrastructure can either be located in one location or distributed – which means that different countries have complementary sub-infrastructures (called nodes) in a common infrastructure. In the first case, the infrastructure's investment ar operating costs are usually relatively high – which is why several countries join forces to finance the infrastructure. Distributed research infrastructure, as defined by ESFRI, is organised as a separate legal entity owned and controlled by the participating countries jointly and with nodes in national ownership. The nodes undertake to make parts of their capacity available to users in the other participating countries. It is important that the national nodes establish a long-term business model that covers operati costs. As a rule, investment and operating costs for the common legal entity will be covered by a membership fee from the participating countries. The vast majority of research infrastructures on the ESFRI Roadmap are distributed.

Principles for Norwegian ESFRI membership

The Ministry of Education and Research has asked the Research Council of Norway to follow up the Norwegian participation in ESFRI. This includes preparing a basis for decision-making and submitting recommendations on Norwegian membership of relevant infrastructures on ESFRI's roadmap. In cooperation with the Ministry of Education and Research, the Research Council has also established principles for the establishment, continuation and eventual termination of membership, how the institutions and the Research Council should relate to membership funding, and to Norwegian representation in the governing bodies of the infrastructures (see fact box). The Research Council's recommendations are drawn up on the basis of the assessment of applications for INFRASTRUKTUR. This means that Norwegian research groups planning to participate in international cooperation on research infrastructure, including membership of the infrastructures in ESFRI's roadmap, must, as a general rule, apply for INFRASTRUKTUR on an equal footing with other Norwegian projects of national importance. This is to ensure that the projects of the highest quality and relevance to Norwegian research are awarded funding. The Research Council prepares its recommendations on Norwegian participation to relevant sectoral ministries that make the final decision on Norway's membersh after each application review process in INFRASTRUKTUR.

It is common practice in most countries for a national authority, usually a ministry or research council, to have a representative i the governing body for the international infrastructure. In most of the international infrastructures in which Norway participate, it the Ministry of Education and Research (KD) or another ministry that has signed the membership agreement.



Norwegian participation in international research infrastructure

Establishment of membership

- It is normally a ministry that formally applies for Norway to become a member of an international research infrastructure and can later withdraw Norway from the collaboration.
- Research groups must apply to the Research Council for new membership. The application will be included in the ordinary application review process in the same way as other applications to the National Financing Initiative for Research Infrastructure. This will ensure that projects of the highest quality and national relevance are awarded. The Research Council will assess the long-term financial obligations that membership entails and whether the membership will constitute added value for Norwegian research, which means that the grant application should be given priority over other national or international grant applications.
- After assessing the grant application, the Research Council will advise the relevant ministry on whether Norway should become a member.

Membership fees

- For localised infrastructures, operating costs will usually be financed through an annual membership fee. The National Financing Initiative for Research Infrastructure could help finance such membership fees. Any commitment is only given for a period of time, usually five years. Any continued funding must be based on regular applications to the National Financing Initiative for Research Infrastructure or evaluations.
- For distributed research infrastructures where one or more Norwegian nodes exist, the Research Council considers membership fees to be part of the national node(s)'s operating costs.
- The National Financing Initiative for Research Infrastructure funds membership fees in the EOSC Association for Norwegian Institutions and is based on annual applications to the Research Council.

Norwegian representation in governing bodies in projects on the ESFRI Roadmap

- In order to anchor membership in Norwegian research institutions, the institutions should be involved in the management of Norwegian memberships.
- In ESFRI projects in the planning and implementation phase where Norway have decided to become a member or recommended by the Research Council, the Research Council must, as a rule, participate in the governing body. However, the Research Council may, after consultation with the relevant ministries, choose to appoint a resource person from a Norwegian research institution to take the Research Council's place in the governing body.
- In ESFRI projects that have entered a well-functioning operational phase, the Research Council will, in consultation with the relevant ministries, consider replacing its own representation on the governing body with a resource person from one of the participating Norwegian research institutions.

Read more about which infrastructures on the ESFRI roadmap Norway participate in under part 3 of the roadmap.

European Open Science Cloud and Norwegian participation

The European Open Science Cloud (EOSC) is an ambitious initiative for open science, launched by the European Commission. The vision for EOSC is a common digital framework to give researchers in Europe access to an integrated and secure data infrastructure and seamless services to manage, analyse, share, collaborate and reuse research data, across disciplines and borders. This will help to promote open research in practice.

To achieve this vision, it is necessary to ensure that the EOSC is useful and relevant to researchers, adapted to their needs and challenges. It is therefore important that these are represented in the organisation and involved in the implementation of the EOSC. Members of the EOSC-Association (EOSC-A) consist of organisations and the growing membership base includes European research performing and research funding organisations as well as research infrastructures and service providers. ESFRI infrastructures have had and continue to play a particularly important role in the implementation of the EOSC, and cooperation with ESFRI is ensured at several levels of the organisation. The Research Council is a member of EOSC-A and is a mandated organisation, given by the Ministry of Education and Research, as a representative of the interests of the Norwegian research system. EOSC-A also has several Norwegian research institutions as members, and their participation helps them to take an active role in the development of the EOSC and promotes cooperation with other research institutions across national borders. This collaboration is of great importance to ensure that the EOSC is relevant and adapted to the needs of researchers different countries and within different disciplines.

EuroHPC Joint Undertaking and Norwegian Participation

Norway is a member of the EuroHPC Joint Undertaking (hereinafter EuroHPC JU) since 2019, whose purpose is to develop, acquire, operate and make available European high-performance computing technology and infrastructure for research and innovation across sectors and national borders. The membership gives Norwegian actors the opportunity to apply for funding through the calls administered by EuroHPC JU. A prerequisite for Norwegian actors being awarded funding under these calls is that Norway is associated with the EU framework programmes that provide funding for the various EuroHPC JU calls. EuroHPC JU manages funds from Horizon Europe, Digital Europe and the Connecting Europe Facility-2. Norway is associated only with th first two framework programmes.

The Research Council represents Norway in the steering group of EuroHPC JU, with one delegate. In addition, a number of Norwegian experts from relevant actors in Norway with expert advice are used when deciding matters of particular interest.

Division of responsibilities in connection with decisions on the establishment of research infrastructure

The white paper "Klima for forskning" ("Climate for research"4) defined a division of responsibilities between the R&D institutions the Research Council and the ministries with regard to decisions on the establishment of research infrastructure.

R&D institutions

Basic infrastructure at the R&D institutions includes scientific equipment required to ensure academic activities at an acceptable level. Investment in and establishment of such infrastructure should be made by the institutions themselves and financed through the institutions' basic allocations. The R&D institutions are considered to be in the best position to assess the need for this type equipment and to ensure simple and good allocation procedures.

The Research Council will contribute to the institutions' own investments by ensuring that all allocations to R&D projects from th Research Council that involve the use of "procured" infrastructure can cover a proportionate share of the depreciation of these infrastructures. In addition, the awards can cover operating costs for the project's use of infrastructure. "Project-specific equipment" may also be funded through the Research Council's grants. This is equipment that is necessary for the implementati of the research project, but does not have use beyond the current project.

The Research Council of Norway

The Research Council is to make decisions on investments in infrastructure of national importance (see text box below). Allocations from the Research Council's budget are intended to support the development of nationally prioritised research areas and nationally important industries with a major need for research infrastructure. The division of responsibility entails that the Research Council must help to ensure that the institutions coordinate when several research groups need research infrastructu but the costs are so high that collaboration is most appropriate. The Research Council assesses infrastructure applications fror NOK 2 million and upwards, and may contribute up to NOK 200 million to individual projects.

The establishment of research infrastructure that requires external funding in excess of NOK 200 million is decided at ministeria or government level. However, as part of the process of assessing other grant applications, the Research Council may assess applications for amounts larger than NOK 200 million and submit recommendations to the relevant ministries. Institutions or consortia wishing to establish research infrastructures that entail such high investments are therefore encouraged to contact th Research Council so that any grant applications can be submitted and assessed together with other applications. Any positive recommendation from the Research Council will be based on a very positive assessment of the infrastructure in accordance wit the Research Council's criteria. In exceptional cases, following dialogue with the Ministry of Education and Research, the Research Council will be able to support a design phase.

Since the primary purpose of the National Financing Initiative for Research Infrastructure is to renew Norwegian research infrastructure, the Research Council is restrictive in allowing this scheme to contribute to financing the operation of research infrastructure. Instead, and as far as possible, expenses for the operation of research infrastructure must be covered by projects that use the infrastructure. The Research Council therefore requires applicants for funding for the establishment of research infrastructure to also submit plans for how sustainable operation of the infrastructures can be achieved. User payments from R& projects that use the infrastructure shall preferably be an important part of operational funding. Expenses for the use of research infrastructure are therefore legitimate costs in any application for research funding from the Research Council's various programmes and funding schemes.

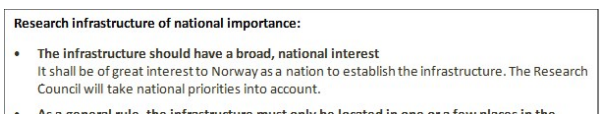
In exceptional cases, however, consideration may be given to whether operating costs for new or existing infrastructure of national importance should be supported through the National Financing Initiative for Research Infrastructure. Infrastructures wi very high operating costs that there are good reasons why ongoing projects, host institutions or other funders are not fully able cover may, after a special assessment, receive long-term support for operations. Similar exceptions may be made under other circumstances where funding from the user projects or the infrastructures' owner institution(s) is clearly inappropriate.

Data management infrastructure

Through the National Financing Initiative for Research Infrastructure, the Research Council will contribute to making research data available in secure systems and in such a form that they can form the basis for research cooperation both nationally and internationally, as well as ensure Norwegian participation in international computer networks. In this context, *research data* means "registrations/records/reports in the form of numbers, texts, images and sounds that are generated or arise during research projects.

Funding from the National Financing Initiative for Research Infrastructure may be sought for infrastructure that promotes the management and accessibility of research data, more specifically for the acquisition and establishment of equipment and tools f collecting data for research, technical systems for quality assurance and preparation of data, and technical systems for archivin and making data available for research.

It is not possible to apply for funding for the implementation of data generation/data collection under the National Financing Initiative for Research Infrastructure, as this is financed through the Research Council's research projects and the R&D institutions' own financed activities (and for some datasets of the ministries and their subordinate administrative bodies).


Research infrastructure of national importance:

- **The infrastructure should have a broad, national interest**
  It shall be of great interest to Norway as a nation to establish the infrastructure. The Research Council will take national priorities into account.

Funding from the Research Council for research infrastructure is available for applications within all disciplines and thematic areas. Furthermore, the Research Council must ensure scientific quality and undertake strategic assessments and emphasise national priorities through the allocations. This may mean that different priority areas or subject areas may be given different emphasis in calls for proposals, so that the Research Council can channel investments towards areas where research activity is high and the need for research infrastructure is great, as well as follow up political and strategic guidelines.

Ministries

Decisions on international research cooperation that entail significant and permanent commitments related to investments and membership fees are made at the ministry level. National research facilities involving investments exceeding NOK 200 million wi also be managed at ministerial or government level, preferably on the advice of the Research Council. Preferably, these are fund that must come in addition to the permanent item for research infrastructure in the national budget.

The value of national coordination

Several types of research infrastructure, such as very expensive scientific equipment, databases and high-performance computing resources, may be uneconomical and difficult for a single research institution to fund. At the same time, it is importan that these investments are utilised effectively by a large number of users. It is therefore often appropriate and necessary for several research institutions to collaborate on building, developing and utilising such infrastructures.

To ensure that such infrastructures are utilised well at the national level and that investments are coordinated appropriately so that researchers' needs are met, the Research Council can play an important role in coordinating and supporting such collaborations.

Analysis and strategic prioritisation of large individual investments

Coordinating the allocation of relatively large funding for research infrastructure of national importance makes it possible to take steps where a few large, nationally important research infrastructures are placed ahead of others in a given allocation process. Similar measures are normally not possible within the Research Council's other instruments and programmes, partly because of limited funding, and partly because particularly large infrastructure investments are easily given low priority in favour of other research projects.

Analyses of the application influx provide the Research Council with an overview of the infrastructure needs that exist, while the national coordination provides a better overview of which investments are actually being made. This puts the Research Council a better position to set strategic priorities, and to be able to align infrastructure calls towards specific disciplines and thematic areas as needed.

Cooperation and division of labour

The Research Council stipulates requirements for collaboration and division of labour between different research institutions and/or between research institutions and actors from industry, public administration or health trusts in order to be eligible to receive funding. To a large extent, the infrastructures' research applications are also aimed at actors outside the R&D institution This creates a culture and practical routines for accessibility beyond the host institutions' own researchers. The Research Council sets similar requirements for cooperation and division of labour between Norwegian institutions when funding Norwegia participation in the development of joint international infrastructures.

Coordinated generic e-infrastructure in Norway

Research from many disciplines is now more data-driven than before. The development of new sensor technology, digitalisation of research data and advanced data analysis tools mean that an increasing number of research fields need large analysis capacity, network transfer, storage and access to large amounts of research data. E-infrastructure for research includes equipment, operations and related services for high-performance computing, data storage, software systems and high-speed networks as well as tools for efficient and secure information management and software for simulation and analysis of data. The term e-infrastructure is also used for digital registers and databases, as well as tools and services to secure and make these accessible.

Norway has coordinated generic e-infrastructure for research and higher education through Sikt and Sigma2 AS (Sigma2). Sikt develops and operates the Norwegian high-speed network for research and education, which connects Norwegian institutions, researchers and students and links them to international research networks. Sigma2 is responsible for procuring, operating and further developing the generic national e-infrastructure for high-performance computing and data storage. Long-term service agreements with the universities of Bergen, Oslo, Tromsø and Trondheim, and basic funding from the Research Council through the National Financing Initiative for Research Infrastructure, constitute a significant part of the funding to Sigma2. This ensures a more cost-effective development of e-infrastructure solutions than requiring institutions to build their own solutions only.

Investments in generic e-infrastructure should be considered in the light of the needs of other national research infrastructures. coordinating investments in these infrastructures, Norway can adapt the level of investment to real needs and focus efforts on th areas that will benefit most from the investments. This also provides the opportunity to bridge the gap between infrastructures an disciplines to support multidisciplinary research. The Research Council will therefore work to ensure long-term, adequate fundin of e-infrastructure that meets the needs it is intended to cover, within the current budget framework.

Recommendations

Recommendations to the ministries:

The large number of applications submitted to the National Financing Initiative for Research Infrastructure, and the excellent assessments that many of these applications have received, show that there is a great need and potential for national research infrastructure in Norway. In some areas, there is a need to establish new infrastructure, and there will be a continuous need to upgrade existing infrastructure to ensure that Norwegian research groups have the equipment required to achieve sufficient quality and efficiency.

It is important that Norway maintain the investment volume in national research infrastructure over the next few years. Some of the investments are expected to be used to cover operations. A long-term approach to funding is crucial for maintaining strategi room for maneuvering to the benefit of Norwegian research over time.

Sharing and reuse of FAIR research data requires special research infrastructure and expertise. The long-term plan uses the recommendations of the Data Infrastructure Committee9 as a basis for further work on data infrastructure. The committee recommends a high, but realistic level of ambition where, by 2030, all subject areas should be offered expertise, guidance and curation of research data, either in the form of national solutions or wholly or partly through participation in European or international infrastructure cooperation. As of 2023, the annual allocation from the Ministry of Education and Research is close NOK 800 million. Based on its long-term ambition to maintain this annual level of funding, the Research Council has proposed a increase in its input to the update of the Government's Long-term Plan for Research and Higher Education to cover increased expenses for tools for handling research data.

Recommendations to R&D institutions:

Have clear plans for how the role as host will be managed

Hosting a national research infrastructure entails a great responsibility and, in many cases, financial consequences. Host institutions should have clear, long-term plans for how they will manage, operate and make available the infrastructures they establish. The institutions should ensure that qualified personnel have special responsibility for day-to-day operations and that th infrastructure is available to all relevant users, including users outside their own institution.

The establishment and operation of data infrastructures entails a national responsibility for access to and secure storage of research data, and an obligation to develop and facilitate the infrastructure for the relevant user groups. Furthermore, it is important to ensure that data can be safeguarded and handled in a long-term perspective. This requires that the institutions consider how they can commit financially and that business models are established for long-term and sustainable operations where relevant user groups and/or user institutions contribute to the funding. To ensure sustainability and anchoring in the research community, it is often important to establish relevant institutional cooperation nationally and/or internationally. Data infrastructures that are established or further developed should strive to build on existing solutions, technology and networks whenever possible.

Good management of the role as host role includes user dialogue and mobilisation of users/the research community to use and utilise the infrastructures. In order to ensure good and sustainable operation of the infrastructures, it is important that the service developed respond to the needs of users.

Highlight infrastructure costs

Research institutions are encouraged to have financial systems that highlight all costs associated with research infrastructure, including operating costs and depreciation of procured infrastructure. As far as possible, these costs should be allocated to the R&D projects that use the infrastructure and be highlighted in the project budget. Thus, those who fund research activities,

including the Research Council, can cover infrastructure costs incurred under the projects. Expenses for the use of research infrastructure are legitimate costs in applications for research funding from the Research Council. Research institutions are encouraged to take advantage of this opportunity.

Prioritise research infrastructure within the basic allocation

The institutions must continue to focus on the need for new investments, upgrades and operation of research infrastructure in their budgets.

Clear guidelines and competence in data sharing and reuse

Research institutions are encouraged to have clear guidelines and good routines for sharing and reusing data that are in line wit national and international guidelines. In addition, the institutions should have solid expertise in sharing and reusing data, both through good support services, but also close to researchers in the research communities. Clear guidelines, good routines and solid expertise in sharing and reusing research data contribute to increased quality, ethical integrity and transparency in researc and promote cooperation and innovation.

The Research Council will:

Further develop national research infrastructures

Through the National Financing Initiative for Research Infrastructure, the Research Council has established a tool to further develop the Norwegian research infrastructure landscape. Quality assessments and a comprehensive strategic assessment will clarify which investments will benefit Norwegian research. The Research Council is working to ensure that this funding scheme works well with other Research Council instruments and funding schemes to ensure that the strategic perspective is safeguarde in the best possible way. The Research Council will also provide research policy advice on investments in research infrastructur

Follow up Norway's participation in international cooperation on research infrastructure and data management

Norway participates in European cooperation on research infrastructure to give Norwegian research access to infrastructures that Norway alone cannot fund. At the same time, European cooperation could contribute to increased use of our national research infrastructures. The decisions will be directed towards international cooperation that supports the priorities of the Long Term Plan. Norway's participation in the distributed ESFRI infrastructures is of greatest strategic importance where we already have research infrastructures that can be coordinated and further developed in cooperation with other European countries.

Stimulate optimal use of infrastructures

The centralised allocation process at the Research Council provides an overview of the research infrastructures that exist at an given time. The requirement to make national research infrastructure available will also improve utilisation of the infrastructures.

Increase innovation capacity in the private and public sectors

The Norwegian business sector consists largely of small and medium-sized enterprises. The Research Council wants research efforts in these companies to be increased – and for more results to be useful. The Research Council wants an innovative business sector that increases research efforts together with the public sector and sees the sector as an important partner and market for the development of innovative solutions. The Research Council wishes to encourage companies and public entities t collaborate more with Norwegian and international researchers in order to better utilise research results for innovation and development. Updated research infrastructure is a crucial factor in achieving this goal, and the Research Council's infrastructure investments are intended to support such cooperation.

Contribute to access to research data

Access to high-quality research data can contribute to increased innovation and knowledge-based management. The Research Council will contribute to increased access to and reuse of research data for industry and the public sector, as well as for research itself, through requirements and guidelines for R&D projects, and through funding of data infrastructures of national importance. The Research Council also has an important advisory role when it comes to sharing and reusing research data and data infrastructures for this.

Contribute to good management, operation and accessibility in line with international principles

Through the call text, application processing and follow-up of the projects, the Research Council will attach importance to the organisation and operation of the infrastructures. The infrastructures shall be established in accordance with international principles for, among other things, user access, proper processing and access to data and results.

Contribute to raising awareness of the consequences the geopolitical situation may have for access t and operation of research infrastructures and responsible sharing of data

Changes in the geopolitical situation have a significant impact on research and research collaboration. The ideals of openness and accessibility face challenges because security policy considerations can limit the sharing of data and make infrastructure available to users. The Research Council has an important advisory role in raising awareness of good safety practices and protection of infrastructure and research results against unauthorised access and misuse, when funding national research infrastructures.

Obviously, there must be limits to the sharing of personal data, but there are also other types of data we must be careful about sharing. The possibilities for data collection are increasing in line with technological developments, including remote sensing fro space, sensor technology and autonomous vehicles. The data volumes are large, the accuracy is increasing, and a significant p of the research effort is naturally shifted to the analysis of collected data. The data is a goldmine for those who are good at exploration. It will sometimes happen that sensitive information is hidden in the data as a kind of bycatch, perhaps also informati of a non-civilian nature.

There will be a number of cases where it is necessary to restrict access to research data, particularly raw data. This may also apply to access to the research infrastructure that generates the data. Greater attention to these challenges is necessary, and t practice of the ideals of openness and accessibility must be adapted to the specific assessments. The changes in the geopolitic situation require increased attention to these issues.

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