



Vetenskapsrådet

INTERIM EVALUATION OF 11 NATIONAL RESEARCH INFRASTRUCTURES – 2012

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SWEDISH RESEARCH COUNCIL
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PREFACE

The Swedish Research Council (SRC) is a governmental agency with the responsibility to support basic research of the highest scientific quality in all academic disciplines. It is also part of the Council's remit to evaluate research and assess its academic quality and success. The Council for Research Infrastructure (RFI) at the Swedish Research Council has the overall responsibility to provide that Swedish scientists have access to research infrastructure of the highest quality. Specifically, RFI assesses the needs for research infrastructure in a regularly updated roadmap, launches calls and evaluates applications, participates in international collaborations and works on monitoring and assessments. The Swedish Government's Bill for Research and Innovation 2008 included new funding for research infrastructure of national strategic importance. As a result a call for investment and operations of new infrastructures was launched 2009, with 9 new infrastructure projects funded 2010-2014. The Swedish Research Council interim evaluation of eight of these new infrastructures together with three infrastructures launched through other Swedish Research Council processes has been conducted in September-October 2012.

The focus of this evaluation has been on issues of organisation, management and accessibility of the infrastructures. This evaluation report constitutes an independent statement from the international Expert Panels and provides valuable information to the funders, universities, and infrastructure managers and scientists alike. The recommendations will serve as a basis for further discussions on the direction of research infrastructures in Sweden. The Swedish Research Council would like to express its sincere gratitude to the Expert Panels for devoting their time and expertise to this important task. The Swedish Research Council would also like to thank the representatives of the infrastructures and the user groups for providing the necessary background material and for giving informative presentations.

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Juni Palmgren
Secretary General
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EXECUTIVE SUMMARY

The Swedish Government's Bill for Research of and Innovation of 2008 included new funding for research infrastructure of national strategic importance. As a result, the Swedish research Council launched in 2009 the call for national Comprehensive Research Infrastructures. Eight research infrastructures got funded through the call for the period 2010 – 2014. This interim – evaluation, includes those eight infrastructures as well as three other research infrastructures funded by the Swedish Research Council through other means, all in all there are eleven research infrastructures included in the evaluation:

The overall aim of the evaluation is to evaluate the outcome and performance of each infrastructure in relation to the intentions in the call for funding and the terms and conditions specific to the infrastructure. Five aspects are of specific interest to the Swedish Research Council in the evaluation:

- 1) the general development of the infrastructure with reference to general management and on-going activities
- 2) the national accessibility of the infrastructures
- 3) the cooperation and coordination between nodes and national and international infrastructures
- 4) user aspects such as support and training
- 5) the role of the hosting university in relation to the research infrastructure.

The outcome of the evaluation will serve as a basis for the Swedish Research Council's decisions on further funding and measures for improvement of the infrastructures.

The research infrastructures were divided into three groups based on their main domain area. Three Panels of international Experts were commissioned to perform the evaluations.

Each infrastructure is given specific recommendations in the evaluation reports. However, some common themes can be identified:

- The need to undertake a risk-assessment to identify and mitigate measures.
- To clarify its role in relation to ongoing activities at national and international level
- To consider possible overlaps in the area
- To develop performance indicators to track and assess its value
- The need to look over the Boards structure and mandate
- To more carefully identify its users and keep track on its usage

The Panels agreed that management issues such as the roles, responsibilities and functioning of the Board, the Director, the host university and the International Advisory Council of the national infrastructures need to be clarified in order for the infrastructures to reach the desired level of success.

Recommendations to the Swedish Research Council were also made by the Panels. In short, they identify high quality management and leadership as essential. Therefore they point to the need for the Swedish Research Council to establish some key management principles valid for the national research infrastructures. The panels identify some crucial questions for the Swedish research Council to take into account:

- What kind of management structure is desired?
- What are the desired leadership qualities?
- What kinds of governing bodies are needed?
- What are the roles, responsibilities and reporting relationships of the boards?
- What is the minimum time requested that the directors devote to infrastructure duties?
- What should the role of the nodes be in the infrastructure management?

The Panels also contributed with valuable recommendations to improve future evaluations of national infrastructures.

SAMMANFATTNING

I regeringens forskningsproposition Ett lyft för forskning och innovation (prop. 2008/09:50) avsatte regeringen nya medel för att finansiera uppbyggnad av nationella forskningsinfrastrukturer av strategisk betydelse. Vetenskapsrådet fick i uppgift att verkställa detta. 2009 utlyste därför Vetenskapsrådet medel för uppbyggnad av nationella s.k. omfattande forskningsinfrastrukturer. Totalt åtta infrastrukturer fick fyra års finansiering för åren 2010-2014. I föreliggande rapport har dessa infrastrukturer utvärderats tillsammans med ytterligare tre infrastrukturer som finansieras av Vetenskapsrådet genom andra medel.

Syftet med denna utvärdering är att identifiera resultaten av de elva infrastrukturernas verksamheter så här långt i deras etablering och uppbyggingsfas, samt erhålla underlag för att ta beslut om fortsatt finansieringsnivå och finansieringsvillkor gällande infrastrukturerna. Fem aspekter har varit av särskilt intresse för Vetenskapsrådet i utvärderingen:

- 1) Infrastrukturernas utveckling med hänsyn till organisation och verksamhet
- 2) Infrastrukturernas tillgänglighet för forskare
- 3) Samarbeten: mellan infrastrukturernas noder; mellan de nationella infrastrukturerna samt mellan nationella och internationella infrastrukturer
- 4) Ett användarperspektiv med särskilt fokus på stöd och utbildning för användare
- 5) Förhållandet mellan värduниверситетet och forskningsinfrastrukturen

Resultatet av utvärderingen syftar till att utgöra underlag till Vetenskapsrådets beslut (via Rådet för Forskningsinfrastruktur) om fortsatt finansiering och om eventuella åtgärder för att förbättra förutsättningarna för infrastrukturerna samt rent konkret, deras verksamhet.

För att optimera förutsättningarna för utvärderingen delades infrastrukturerna in i tre grupper baserade på deras verksamhetsområde och inriktning. Tre paneler bestående av totalt elva internationella experter utsågs att genomföra utvärderingen.

Som underlag för utvärderingen har panelerna fått tillgång till självvärderingar som fokuserat på de aspekter som listats ovan från infrastrukturerna. Dessutom har panelerna haft tillgång till verksamhetsplaner, strategiska planer, organisationsscheman samt resultat från en användarenkät som genomförts inom ramen för utvärderingen. Sammantaget syftade materialet till att bilda underlag för panelernas frågor till infrastrukturerna under de hearings med panelerna och representanter för infrastrukturerna som genomfördes i Stockholm i september 2012. Inga platsbesök har genomförts.

Panelerna har utvärderat respektive infrastruktur utifrån sina egna villkor vilket betyder att varje panel har skrivit en rapport per infrastruktur. D.v.s. den övergripande rapporten består av elva unika och specifika utvärderingar. Panelernas ger tre olika typer av rekommendationer; specifika rekommendationer till respektive infrastruktur; rekommendationer till Vetenskapsrådet gällandes dess hantering av infrastrukturerna samt rekommendationer gällandes Vetenskapsrådets utvärderingsarbete.

Specifika rekommendationer till respektive infrastruktur redovisas i slutet av varje utvärderingsrapport men det finns emellertid några gemensamma teman som berör de flesta av infrastrukturerna. Dessa avser behov av att:

- genomföra risk-bedömningar och identifiera strategier för att minimera riskerna
- tydliggöra den egna rollen i förhållande till andra nationella och internationella aktiviteter och hantera eventuella överlappningar av aktiviteter mellan infrastrukturer
- utveckla indikatorer för att kunna följa upp och utvärdera sina verksamheter
- se över styrelsernas sammansättning och mandat
- mer noggrant identifiera sina användare samt föra statistik över sin användning

De tre panelerna är tillsammans överrens om att ledning- och styrfrågor så som roll- och ansvarsfördelning, styrelsens och föreståndarens funktion, värduниверситетets roll samt infrastrukturernas interna-

tionella vetenskapliga referensgrupper (där de förekommer) behöver tydliggöras för att infrastrukturerna skall kunna nå sin fulla potential.

Vad gäller rekommendationerna till Vetenskapsrådet så pekade panelerna bland annat på ledningsfrågor och ledarskap som viktiga kvalitéer för att optimera verksamheterna. Panelerna pekar även på behovet för Vetenskapsrådet att därför etablera grundläggande normer för hur ledningsstrukturen för nationella infrastrukturer bör se ut och fungera. Panelerna identifierade några viktiga frågor för Vetenskapet att beakta i detta avseende:

- Vilken typ av ledningsstrukturer är önskvärda?
- Vilka kvalitéer och ledaregenskaper är önskvärda hos den/dem som får ansvaret för att bygga upp, driva och utveckla en forskningsinfrastruktur?
- Vilka typer av beslutsfattande organ är nödvändiga?
- Vilken är styrelsens roll i förhållande till ansvar och rapporteringskrav?
- Vilken arbetsinsats av föreståndarna, i form av tid, bör vara ett minimum för att kunna leda verksamheten på ett tillfredsställande sätt?
- Vilken är modernas roll i infrastrukturernas ledning?

Panelerna har även bidragit med värdefulla rekommendationer till Vetenskapsrådet för att förbättra framtida utvärderingar av nationella infrastrukturer.

1. INTRODUCTION

1.1 Background – Funding of national infrastructures

In the terminology of the Swedish Research Council the term research infrastructure refers to central or distributed research facilities, databases or large-scale computing, analysis and modelling resources. The difference between a distributed research infrastructure and a network for collaboration may be difficult to distinguish. However, an infrastructure, in contrast to a network, should always have joint management, and the nodes should be part of the same overarching organization. A national infrastructure should be openly accessible to researchers and research in the field based on scientific excellence, independent of home university/institution. Furthermore, the board of the national infrastructure should be independent in relation to the operational management of the infrastructure.

The Swedish Research Council funds national infrastructures and participation in international infrastructures, while universities are responsible for local infrastructure and equipment. The eleven infrastructures evaluated at this point are all national infrastructures or national nodes of international infrastructures. The infrastructures are all funded by the Swedish Research Council through different schemes. As can be seen in Figure 1 below most of the infrastructures are funded through the 2009 call for build-up and operation of comprehensive research infrastructures). Only infrastructures already included in the Swedish Research Council's Guide to Infrastructure were eligible to apply and funding for international distributed infrastructures was restricted to the Swedish nodes and the Swedish participation in international projects. Five of the infrastructures are also funded through the funds for infrastructures within the framework of the government initiative on strategic research areas (SRA) from 2009.

The remaining infrastructures - ECDS, MyFab and MAX-lab - are funded through different schemes. ECDS is funded through an agreement between the Swedish Research Council and the Swedish Meteorological and Hydrological Institute (SMHI) after a call to host the ECDS that was won by SMHI- in 2008. The Swedish nano- and micro-fabrication network, MyFab, which includes cleanroom laboratories at Chalmers University of Technology, the Royal Institute of Technology, and Uppsala University, became a national infrastructure in an agreement between the Swedish Research Council and Chalmers University in 2010. MAX-lab is funded through an agreement between Lund University and the Swedish Research Council, the most recent one signed in November 2011.

Panel	Infrastructure	Comprehensive Research Infrastructures funding	Strategic Research Areas funding
A	ICOS Sweden (Integrated Carbon Observation Systems, Sweden) Coordinated by Lund University	X	
	Swedish LifeWatch (e-Science and Technology Infrastructure for Biodiversity Data and Ecosystem Research) Coordinated by Swedish University of Agricultural Sciences	X	X
	ECDS (Environment Climate Data Sweden) Hosted by Swedish Meteorological and Hydrological Institute		
B	BBMRI (Biobanking and Biomolecular Resources Research Infrastructure) Coordinated by Karolinska Institutet	X	X
	BILS (Bioinformatics Infrastructure for Life Sciences Coordinated by Linköping University	X	X
	CBCS (Chemical Biology Consortium Sweden) Coordinated by Karolinska Institutet	X	
	SNISS (Swedish National Infrastructure for Large-scale Sequencing) Hosted by Uppsala University, KTH Royal Institute of Technology	X	X
C	SuperAdam (reflectometer) Coordinated by Uppsala University	X	
	PRACE (Partnership for Advanced Computing in Europe) Coordinated by Uppsala University, SNIC	X	X
	MyFab (Swedish research infrastructure for micro- and nanofabrication) Coordinated by Chalmers University of Technology		
	MAX-lab (National Electron Accelerator Laboratory for Synchrotron Radiation Research) Hosted by Lund University		

Table 1: Summary of panels, infrastructures and funding schemes

1.2 The evaluation process

The overall aim is to evaluate the outcome and performance of each infrastructure in relation to the intentions in the call for funding and the agreed terms and conditions specific to that infrastructure.

The outcome of the evaluation will be a basis for the Swedish Research Council's decision on further funding and measures for improvement of the infrastructures. Further, the evaluation should provide recommendations for improvement on management and activities at the infrastructures.

Three expert panels have been commissioned for the evaluation of national infrastructures (short CVs of all panel members can be found in Appendix 7):

Panel A (ECDS, ICOS Sweden, and Swedish LifeWatch):

Susanne Holmgren, *University of Gothenburg, Sweden (Chair)*

Michael Schultz, *Natural Environment Research Council, U.K*

Russ Schnell, *National Oceanic & Atmospheric Administration, U.S.A*

Mari Wells, *Finnish Environment Institute, Finland*

Panel B (BBMRI, BILS and SNISS):

Tuula Teeri, *Aalto University, Finland (Chair)*

Taina Pihlajaniemi, *University of Oulu, Finland*

Eckhart Curtius, *Federal Ministry of Education and Research, Germany*

Panel C (MAX-lab, MyFab, PRACE, SuperAdam):

Odd Ivar Eriksen, *the Research Council of Norway, Norway (Chair)*

Aaron Stein, *Brookhaven National Laboratory, U.S.A*

Doris Keitel-Schultz, *DKSST Consulting, Germany*

Cherri Pancake, *Oregon State University, U.S.A.*

The panels were asked to evaluate the infrastructures in relation to the intentions in the call(s) for funding and the agreed terms and conditions. The following aspects were in focus of the evaluations:

1. general development of the infrastructure with reference to general management and on-going activities,
2. national accessibility of the infrastructures,
3. cooperation and coordination between nodes and national and international infrastructures,
4. user aspects such as support and training and
5. the role of the hosting university

The expert panels have based their evaluations on the following data:

1. Self-evaluations from the infrastructures
2. User surveys made for each infrastructure
3. Hearings held by the expert panels with representatives from the infrastructures

In addition to the above described data, the panels were also provided with the comprehensive research area and the strategic research area calls and the terms and conditions for each of the infrastructure and the Swedish Research Council's Guide to Infrastructures 2012.

The self-evaluation (1) focused on six major themes: Organisation and operations, Access to the infrastructure, User support and training, Access to data and research results, Results and outcomes and the Communications strategy of the infrastructure. The self-evaluation also included an analysis of Strengths, Weaknesses, Opportunities and Strengths (SWOT). The infrastructures were also asked to attach their long term strategy, an organisational chart and their operational plan for 2012 to the self-evaluation. The self-evaluation forms were distributed to the infrastructures on May 11, 2012 and the self-evaluation reports were due back to the Swedish Research Council in mid-June 2012 (Appendix 5).

On June 25 2012 a user survey (2) containing 16 questions covering background data about the user, accessibility to the infrastructure, services provided, training, and user forum was distributed as a web survey to users that had been listed by the infrastructures. The questionnaire (Appendix 6) applied both closed format and open format questions which gave the respondents an opportunity to comment on questions and provide feedback to the evaluation team. In total 1909 names of unique users were provided by the infrastructures, and 554 (29%) had responded to the survey when it was closed on August 10, 2012. Due to the low response rate (which varied significantly between infrastructures), the results from the surveys has only been used as an input to the expert panels for raising questions to the infrastructures during the hearings.

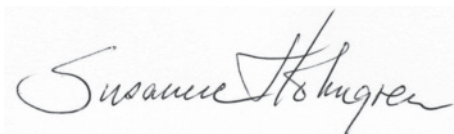
The expert panels met for hearings (3) with representatives of the infrastructures in Stockholm September 17-19, 2012. Each infrastructure was asked to send 1-3 representatives to the hearing, and to do a 30 minute presentation covering the five aspects of focus in the evaluation (see above). After the presentation the panels had 1.5 hours to interview the infrastructure representatives.

This evaluation report has been written by the three expert panels except from the executive summary, the introduction and the first part of chapter three which has been written by Eva Mineur project manager, Bo Sandberg and Stina Gerdes Barriere from the Swedish Research Council who administered the evaluation.

2. EVALUATION REPORTS

At the request of the Swedish Research Council, we have evaluated the National Infrastructures. The panels take full responsibility for the judgements and the recommendations given in the following reports.

Stockholm, November 2012



Susanne Holmgren, Chair Panel A



Tuula Teeri, Chair Panel B



Odd Ivar Eriksen, Chair Panel C

2.1 Reports from Panel A

Panel A have evaluated Environment Climate Data Sweden (ECDS), Integrated Carbon Observing System, Sweden (ICOS) and Swedish LifeWatch (SLW).

2.1.1 ECDS

Environment Climate Data Sweden (ECDS) aims to establish a Swedish infrastructure for environmental and climate research, with full, open and trouble-free access to data. The task is primarily to supply a metadata catalogue on repositories stored elsewhere, through a web portal. ECDS will develop routines that facilitate searching, publication and long-term accessibility of data. ECDS also has the ambition to be a competitive and attractive Swedish node for international collaboration.

Terms and conditions for the development and running of ECDS were agreed upon by the Swedish Research Council and the Swedish Meteorological and Hydrological Institute (SMHI) on May 20th 2009. The support from SRC has been 4.5 MSEK per year and from SMHI an increasing amount reaching the level of 1.9 MSEK in 2012 (all as *in kind*).

The infrastructure is still under development. So far approx. 45 projects have contributed data to the database, and approx. 60 users or information seekers are recorded. There is no monitoring of users of the database.

Organization, leadership and management

The panel met ECDS Director Thomas Klein, project manager Britt Frankenberg and Joakim Langner, chair of the ECDS board. The management group includes the Director of the infrastructure (80%), the project manager and a project group of another six people, employed approx. 50% each. There is a Board of six members, and a Scientific Advisory Committee of four people. A large Reference Group (user forum) is advisory to the Board and the management team. The management team has a good set of relevant skills and appears to function well. In order to develop as a truly national resource, it is important for a national infrastructure to have a degree of independence from its host organization. The evaluators believe that this independence, and the reputation of ECDS, could be put at risk by the current situation of the Board being chaired by an employee of the host institution.

Results and outcomes

It is 3.5 years since ECDS was established and it is now in its first operational year. It has met its target of obtaining documentation on 100 data resources in its first year. But this is only the start, and it is clear that a much greater volume will be needed before ECDS is recognised as a key Swedish infrastructure for environmental and climate research. There are many more important Swedish datasets, of varying size and complexity, for which information is needed. The biggest challenge for ECDS is to persuade researchers from a wide range of universities and organizations to provide metadata information so that the threshold is reached at which users will have the incentive proactively to share data. ECDS showed at the hearing that it is well aware of this challenge, and its three main activities of development, support and marketing are being used to achieve the goal of being a national resource.

ECDS has taken responsibility for Swedish International Polar Year data and some other datasets, but without data duration or archiving responsibilities. The evaluators recognise that handling data (as well as metadata) is important for ECDS, which needs material for development, demonstration and training.

A key role of ECDS is providing help and advice to users on data storage, sharing and production of metadata. The website and helpdesk are well used and appear to be largely valued by users. A “dataset citation” section in the metadata profile allows a provider to insert information on articles associated with the respective dataset. This information can easily be used for reports etc. from ECDS. However, tracking of datasets delivered through the ECDS-initiative is at present not available and will require the use of data identification schemes such as DOI.

More generally, ECDS has worked to achieve compliance with INSPIRE and to promote good practice in data access and sharing.

The evaluators believe that the value added by ECDS is in providing easy access to a wide range of climate and environmental data through a single metadata portal. At present this portal is underutilized but has the potential to fulfil an important function in providing a node for environmental data tracking and exchange.

ECDS has made a good start to meeting its objective of becoming a strategic, national resource for the long-term preservation of, and access to, important data. The evaluators recognise, however, that there is a great amount of further work as well as strategic decisions needed before the objective can be fully met. For example, the evaluators find it important that environmental monitoring and other agency data can be accessed through ECDS as soon as possible.

Accessibility

The computer and software assets available at SMHI for the ECDS project are large, efficient and appear to allow for relatively easy access to the data for outside users. There is a large team of support staff to assist in data acquisition, processing and storage. The Scientific Advisory Committee and the users' reference group provide insights for the development of accessibility and user needs.

A key issue is at present the service is greatly underutilized by the scientific community. There are probably a number of reasons for this. In particular: the scientific community does not know about the service, or the community is aware of the infrastructure and its services but does not feel that it adds

value to their data sets. In the first case, ECDS will need to engage in targeted marketing to determine if the low utilization is lack of knowledge of what is available. If the marketing results show that scientists are knowledgeable about ECDS but are not interested in contributing, ECDS will need either to change its service model or possibly to consider allowing another data service provider to use the resources presently being expended through SMHI.

Accessibility to the ECDS data sets appears to be easy and straightforward. There are procedures in place to assist both those depositing data and those accessing information available through ECDS. The large and diverse user forum providing feedback to the ECDS suggests that any shortcomings in procedures for accessing and disseminating data will be addressed in a timely manner.

The evaluators feel that, as ECDS grows to fill its potential, the user forum will identify additional needs for user training and point to additional user support that ECDS could provide. ECDS's further development should be very sensitive to adding value to the existing ways of storing, and gaining access to, environmental and climate research data.

Collaborations

There are two nodes of ECDS: the host (SMHI) and the National Supercomputer Centre (NSC), which houses the SNIC/Swstore data repository. There is a history of strong links between the two host bodies, which has contributed to effective collaboration between the nodes.

The evaluators noted the letters of support from eight Swedish universities or other bodies included in the self-evaluation, noting that these probably indicate the value placed on ECDS by users rather than infrastructure collaborations. However, there are good national collaborations, for example with the Swedish National Data Service. There is collaboration with Swedish LifeWatch (SLW), and ECDS recognizes the potential for collaboration with other Swedish ESFRI projects such as ICOS Sweden and PRACE. ECDS feels that the lack of a direct relationship with an ESFRI project is a disadvantage and limits its profile and further development.

At the hearing, ECDS made clear to the evaluators that its mandate, set out in the Agreement between SRC and SMHI, restricts its scope for international collaboration, though the Director and SMHI have strong links with GEO and GEOSS. ECDS demonstrated an appetite for developing international collaborations but made clear to the evaluators that they had neither the resources nor the mandate.

Since environmental and climate data are for the most part borderless, international collaborations are a great asset. The evaluators welcome the existing national collaborations and believe that stronger international links are needed, for example through ESFRI projects. It is important that a future Agreement for ECDS resolves the issue of its international positioning.

It is unclear to the evaluators how the respective data roles of ECDS and other infrastructures such as ICOS Sweden and SLW will develop as the infrastructures become mature and possibly part of wider European infrastructures.

The ECDS has its infrastructure in place, as agreed to in the operating contract, and is working towards the goal of developing additional collaborations. The evaluators agree that it is important to increase the number and extent of these collaborations, and believe that this is achievable through strategic planning and effort.

Efficiency of usage

ECDS has been in operation now for around one year. While noting the small sample size, most users replying to the recent user survey find ECDS valuable. However, the survey raised issues of the sufficiency of user support and of the role of ECDS in providing long-term access to data (metadata) vs. its role as a repository. ECDS has tried to increase the communication efforts through, for example, building up the website, www.ecds.se, and producing basic promotional material. The ECDS Reference Group has influenced the design of the website. Despite this, the number of contributors to the database is quite low, approx. 45, presently contributing to a total of 110 data sets.

While the evaluators believe that the metadata role should take priority, ECDS could discuss with SRC and SMHI the possibility of broadening its mandate to store and distribute data sets. The evalua-

tors are not in a position to determine if data storage by ECDS would overlap/duplicate similar efforts by other organizations or infrastructures. This should be part of the discussions on the future development of ECDS.

The evaluators feel the urgency for substantially increasing the efficiency of usage. In order to do this, ECDS needs to clarify and more widely communicate its valuable role as a supportive national service provider enabling long-term access to metadata. Key stakeholders (universities and the research community at large, other national infrastructures, government agencies) have to be convinced of the value added by services that ECDS provides. Unless the added value is evident to key stakeholders, ECDS will not be able to substantially increase the number of users willing to share their data. It is evident that the role of ECDS in the future is very much dependent on providing value to the research community at large. The evaluators support the idea expressed by ECDS that Sweden introduces a formal mechanism whereby state supported researchers are required to make available their data (metadata) for general public access. A statement to that effect is included in the terms of research grants by SRC and FORMAS since 2012. If this were to be instituted by more Swedish research funding organizations supporting environmental and climate research, a better return on research funds would be achieved and an added incentive provided to researchers to make their data accessible through ECDS. There are two main elements of usage of ECDS: contribution of metadata and access to metadata. The evaluators are concerned by the level of contribution of metadata whilst recognizing that the infrastructure is still at an early stage. The success of ECDS, which accepts its top priority is to increase the input of metadata, is largely dependent upon a major improvement in this activity. The evaluators are content with the current level of usage of the metadata currently captured, and this usage will increase with increasing level of metadata as the portal adds increased value.

The role of the host university

This infrastructure is unusual amongst those supported by SRC in that it is hosted by a separate government agency, SMHI, rather than by a university. SMHI provides a good framework for this type of infrastructure development, being the expert host of many similar enterprises in Sweden. It was made clear at the hearing that ECDS is not considered a separate group at SMHI and, although ECDS has a separate budget, the two parties work very closely together to mutual benefit. In order for ECDS to develop an independent facilitative service brand among the wider scientific community, the evaluators would like to see it having a more independent position within SMHI.

Conclusions

The value of ECDS to Sweden is in providing easy access to information on a wide range of climate and environmental data through a single metadata portal. The evaluators consider that ECDS fills an important need and has made real progress towards achieving its overall objective. However, there remain substantial challenges to achieving its full potential and facing major decisions in the near term on its future direction. In particular the role of ECDS in handling data, in addition to metadata, and its international role need to be addressed. These issues need to be recognized in a future Agreement for further support. Furthermore, ECDS needs a strong Board which is independent of the host institution in terms of membership.

The evaluators suggest that ECDS hold discussions with the SRC and SMHI on the possibility of broadening the mandate of ECDS to store and distribute larger data sets. The evaluators are not in a position to determine if such data storage by ECDS would overlap/duplicate similar efforts. This should be part of the discussions regarding the future development of ECDS.

The evaluators have noted an apparent mismatch between the aspirations of ECDS in international collaborations and the restrictions placed on this by its current mandate. This is an important issue that needs to be resolved as part of the future strategy for ECDS.

In view of these major challenges, the evaluators believe that ECDS should draw up and maintain a risk register, including mitigation measures.

The panel's recommendations

Recommendations to the Swedish Research Council

- The infrastructures should be required to undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans. Detailed guidance should be provided by the SRC to the infrastructures.
- Consideration should be given to including, in the terms of funding grants for environmental and climate research, a requirement for researchers to provide metadata to ECDS.

Recommendations to ECDS

ECDS has made a good start but there are some key issues to address before it can achieve its objective of becoming a strategic, national resource for the long-term preservation of, and access to, important data. The following recommendations are in priority order, with the most important first.

- ECDS should continue to encourage researchers, by all available means, to submit metadata and should initiate discussions financing bodies for environmental and climate research that do not already do so, on procedures on how researchers could be required to do this.
- ECDS should ensure that it has a strong and independent Board to provide strategic advice, for example in assisting discussions with the SRC arising from our other recommendations. In order for ECDS to develop and be recognised as a truly national resource, neither the chair nor members of the Board should be staff of the host institution.
- ECDS should clarify its role in relation to other Swedish infrastructures that have major data roles, particularly for ESFRI projects where there are plans for European level databases and portals.
- ECDS should undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans.
- ECDS should work with the SRC to clarify its role as an international player and this should be set out in the Agreement for further support. The evaluators believe that stronger international links are needed for gaining more value of the service provision of ECDS.
- ECDS should discuss with the SRC its role as a data (in addition to metadata) repository, for example to store and distribute larger data sets, and this should be clarified in the Agreement for further support. The evaluators are not able to take a position on whether broadening the ECDS mandate would produce overlaps and inefficiencies regarding the role of other organizations such as other infrastructures, agencies, universities etc.
- ECDS should act to include metadata on environmental monitoring and other agency data as soon as possible

2.1.2 ICOS

ICOS (Integrated Carbon Observing System also called ICOS RI) is a pan-European research infrastructure for quantifying and understanding the greenhouse gas balance of the European continent and adjacent regions. ICOS Sweden is a national research infrastructure consisting of three atmospheric and six ecosystem stations that will provide accurate measurements of greenhouse gas concentrations and fluxes. These measurements will be used to produce long-term concentration trends and source/sink distributions of greenhouse gases on various scales. Towers are built beyond ICOS specifications so that they can also be used for other types of research. The Agreement between Lund University and SRC, and consortium memorandums, were signed during 2011-2012. The inauguration of ICOS Sweden, which is in the construction phase, is planned in late September 2012. During 2011, preparatory activities were undertaken including the consortium agreement, funding allocations between the partners, and selection of the Board that in turn established the organization and management structure of ICOS Sweden. In addition, the Station Coordination group was organized. The

international Scientific Advisory Committee has not yet been appointed for ICOS Sweden, but the Terms of Reference are being prepared.

The 2012 funding for ICOS Sweden is 17.5 MSEK from the SRC, 3 MSEK from the host Lund University and 3.3 MSEK from partner universities. Funding for 2013 and 2014 is expected to be at the same levels. The ecosystem stations are coming on line and the instruments for the atmospheric stations will be procured and installed in early 2013. When operational and tested in late 2013, all ICOS Sweden sites will join the EU-funded ICOS demonstration project. In addition, ICOS Sweden has been active in engaging with the formulation of a Carbon Portal facility for ICOS RI that may be located at Lund University. Due to the early construction phase of ICOS Sweden, there are no data users as yet.

The evaluators view the launching of preparatory activities in the construction phase of ICOS Sweden as being well streamlined, and the progress outstanding.

Organization, leadership and management

The panel met project coordinator Anders Lindroth and scientific coordinator Maj-Lena Linderson.

The Board appears to be working very well and providing strong guidance to ICOS Sweden. While the Director is employed 50% of his time on the project, it requires 100% of the Director's time at least until ICOS Sweden is fully operational at the end of 2013. The planning for and implementation of the Carbon Portal, that was not in the original plans and budget, could well require that the Director devote 100% of his time to ICOS for a few additional years if the portal is constructed in Sweden.

Results and outcomes

ICOS Sweden is a large, complex and technical infrastructure that is currently in the construction phase. Some measurement programs have been ongoing at the ecosystem sites for a number of years prior to their incorporation into ICOS Sweden. The instrumentation of the atmospheric sites is progressing although the purchase of some specific instruments is delayed by time-consuming procurement processes. So far, there are no direct outcomes from the infrastructure in the form of *e.g.* publications using data obtained from ICOS Sweden, but according to plans data users will eventually be accessing data through ICOS RI. The data users will be registered when downloading data from ICOS RI with a requirement of acknowledgement when publishing research using the data. ICOS RI is still under construction, and the exact procedure is not yet defined.

Nevertheless, the added value of ICOS Sweden is very clear both for science and society. The standardized data ICOS will produce are essential for testing and further developing earth system models that will provide scenarios on future climate and enhance our understanding of the physical, chemical and biological processes regulating temperature. For climate policy development and international negotiation processes, this understanding is fundamental, as well as for *e.g.* developing sustainable production systems with low carbon emissions.

The evaluators would like to see a risk analysis included in the operational and strategic plans of ICOS Sweden in addition to the SWOT analysis in the self-evaluation.

Accessibility

Data from ICOS Sweden will be freely available electronically through an ICOS RI Carbon Portal, after being error checked and in many cases processed through synthesis and/or modeling modules. All greenhouse gas measurements must be calibrated and inter-compared with WMO traceable standards so that the ICOS Sweden data will be acceptable into global data bases and can be used in models. The data should be put into data sets along with the standards and calibration data and all data points, outliers included. As such, this high quality data will be well documented and come from one organization that will be easy to contact and interact with. Expert advice on the data will be provided by a group of specialists in different scientific areas affiliated with ICOS Sweden.

It is suggested that one "scientist in charge" be responsible for all of the same measurements across the ICOS network and that a clear set of written procedures be produced so that alternates will follow the same exact procedures. For instance, one person would be responsible for CO₂ measurements and

their data at all of the measurements sites, and would be responsible for checking and comparing the data across the network on a regular basis, but no less than twice a week. This type of structure allows for subtle errors at a site to be detected quickly. This same person should know a lot about the operation and measurement characteristics of the particular instrument making the measurement he/she is responsible for.

Metadata must be maintained and be available along with the regular data sets. The production and handling of metadata must be structured with the person responsible for one measurement across the network also responsible for the metadata for those measurements. The excellent procedures developed for Finnish aerosol measurements might be a model to follow.

For scientists interested in installing ICOS related instrumentation at the field sites, ICOS Sweden will help with field installations and provide on-site supervision of their instruments. User training to use the ICOS data and facilities will be provided as required. Use of the sites will be free of charge as far as possible though the Director admitted that the pressure that this would place on limited ICOS Sweden resources was unknown. Annual workshops will be held at which data analyses will be presented and ICOS Sweden operations discussed and plans developed for the coming year's measurements.

In summary, the evaluators feel that the ICOS Sweden program is on a sound footing and that the data to be collected will be valuable for both Sweden and the global community. It is further felt that ICOS Sweden will make the data accessible in a timely and proficient manner.

Collaborations

The ICOS Sweden consortium has a total of five nodes, including the Coordination Office at Lund University. Uppsala University, which will manage the proposed marine site, is expected to become the sixth node. There is a good working relationship between the nodes, which have complementary areas of expertise.

There is a good awareness of Swedish activity in other ESFRI projects and contact where this is judged to be productive. It is proposed to collaborate with ECDS by providing metadata, at least until the ICOS Carbon Portal is operational, though no discussions have yet taken place and ICOS Sweden admits to not knowing how much work will be involved in this. ICOS Sweden would like to include activities of the Swedish teams involved in ACTRIS (Aerosol, Cloud, Trace gases Research Infrastructure). There are collaborations between individual ICOS Sweden sites and other groups and these will be developed through the use of the ICOS Sweden sites for related research.

The main international collaboration is with other countries within the ICOS RI and especially with Nordic countries. ICOS Sweden sees itself as a component of ICOS RI with an uncertain future if the ERIC fails. ICOS Sweden is actively engaging in technical and other aspects of the ICOS RI preparatory phase project and the Director has been open about the tensions and frustrations that have resulted. ICOS Sweden has led in developing the concept of the ICOS Carbon Portal, which Sweden is planning to bid to host. If the bid succeeds it is possible that it would be hosted by Lund University. At present, involvement in the ICOS RI discussions takes a significant amount of time of the Director.

The evaluators conclude that there is good collaboration both between the nodes and with other national programmes. There is active engagement with the ICOS RI. While the evaluators support the intention for Sweden to bid to host the Carbon Portal, they believe that there is a case for treating this as a separate project with its own funding. ICOS Sweden could benefit from making contact with the Carbon Cycle Greenhouse Gas measurements division of the National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colorado, USA which has many decades of experience in measuring greenhouse gases from the ground, light aircraft and from high towers. In addition, this NOAA division is responsible for producing and maintaining the WMO world standards for all of the greenhouse gases as well as ozone and most halocarbons.

Efficiency of usage

At this early implementation stage of the ICOS Sweden infrastructure development there are no user surveys available. However, some of the atmospheric and ecosystem stations have been up and running

for some years, so there is some information available on their usage. Currently, there are around 20 active research groups in modeling using the data produced on these sites, and around the same number of research groups actually working on projects based at the sites in the ICOS Sweden network. ICOS Sweden has developed a clear prioritization procedure for access to be adopted later when the level of usage increases. Applications will be evaluated in terms of resources requested (space, time, sampling etc.). In situations where projects are requesting more resources than available, the proposals will be sent out for an external review having scientific excellence as one of the main criteria. The ICOS Sweden Board should then make the prioritization of access based on the reviews. For those projects that physically use the observation stations, the personnel support of ICOS Sweden will concern supervision of measurements initiated by such projects. Each station within ICOS Sweden will also have a person responsible for local quality control (station principal investigator) who can also assist data users with questions about data collection.

The evaluators are confident that ICOS Sweden has the ability to introduce uniform methods for gaining systematic information on the users and the efficiency of use of the facilities. Results accounting has a lot of possibilities for systematic, automatized and cost-efficient delivery of statistics for reporting as well as for providing essential information for taking necessary actions for improving efficiency of usage.

The role of the host university

Lund University is the host university and coordinates operations at the nine stations with the University of Gothenburg, Stockholm University, Swedish University of Agricultural Sciences and the Swedish Polar Research Secretariat. There were some delays in getting the implementing agreements in place as this type of legal structure applicable to the infrastructure concept and governance was new to both SRC and the University of Lund. Those problems appear to be in the past. The overall operations of ICOS Sweden within the University of Lund appear to be on a solid and professional footing. As far as the evaluators can understand, the host university is supportive and takes a keen interest in the activities of ICOS Sweden, but allows it to act independently.

Conclusions

The ICOS Sweden infrastructure is a critical facility that will provide invaluable data on the changing concentrations of greenhouse gases in the Swedish environment. Eventually, when greenhouse gas accounting becomes a reality, the ICOS Sweden data will be used to balance the accounting for Sweden, the Nordic countries and Europe as a whole. Prior to that time, the high quality greenhouse data will be used in models to help predict the trends in the changing climate being driven by greenhouse warming.

ICOS Sweden appears to be meeting the expectations presented in the planning and contract documents in establishing the infrastructure in a professional and world class manner. The evaluators are impressed by the openness of the ICOS Sweden management team and pleased with the amount of progress in the relatively short time since agreements have been signed and infrastructure planning completed. The ICOS Sweden management team is to be commended.

The evaluators caution that once the infrastructure is completed and all instrumentation is operating, the next phase of maintaining a high quality data stream for decades will be formidable. The effort and resources required to support and inter-calibrate instruments across a diverse network to produce continuous, unquestionable data sets that are maintained and traceable over decades, will take as much effort and resources as did the initial establishment of the ICOS Sweden network.

It should be noted that it will take decades of measurements to determine accurately the sources, sinks and trends of greenhouse gases in Sweden and how these fit into the context of European and global sources and sinks. Such measurements will become increasingly important once global accountability for greenhouse gas emissions become a reality. As such ICOS Sweden should take the time to get the infrastructure in place correctly, and to develop plans and ensure a stable funding basis looking ahead at least 50 and probably 100 years. The greenhouse gas issue will require it.

In the event that ICOS RI should not become a reality, ICOS Sweden should be supported and maintained for decades. The data are too important to not collect beginning as soon as ICOS Sweden is operational, and continued for a century. Hosting the Carbon Portal may be attractive and valuable for Sweden, but is not critical for the ICOS Sweden measurement program. In the current situation, the first priority should be on data gathering, calibrations and handling.

The panel's recommendations

Recommendations to the Swedish Research Council

- The infrastructure should be required to undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans. Detailed guidance should be provided by the SRC to the infrastructures.
- The Swedish Research Council should begin planning for a funding and management structure that will support ICOS Sweden uninterrupted for many decades to come.

Recommendations to ICOS

The evaluators are impressed with the status and current rate of progress of ICOS Sweden. However, there are some aspects that could be improved:

- The Director should be employed 100% time on ICOS Sweden.
- ICOS Sweden should undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans.
- Instrumentation for greenhouse gas measurements must be the same for all stations in the ICOS Sweden network with the same instruments ideally used throughout the ICOS RI networks.
- One "scientist in charge" should be responsible for the same instruments, measurements and data streams across the ICOS Sweden network.
- Data from across the network should be checked and compared on a regular basis by the single person responsible for that type of measurement, but no less than twice a week.
- All greenhouse gas measurements must be calibrated and inter-compared with WMO traceable standards.
- The instrument procurement process should be facilitated for easier sole source purchases of specific equipment.
- ICOS Sweden should develop a close working relationship with, and learn from the mistakes of, the Carbon Cycle Greenhouse Group of NOAA, USA that maintains the WMO Greenhouse Gas standards and has extensive experience in surface and tower measurements stretching over 50 years.
- ICOS Sweden should establish a close working relationship with the World Meteorological Organization Global Atmospheric Watch (GAW) program and work towards obtaining WMO GAW status for at least three of the most well instrumented ICOS Sweden sites.
- ICOS Sweden should consider developing some form of an annual greenhouse gas index for Sweden.
- ICOS Sweden should encourage and assist in the publication of at least two high profile scientific papers per year based upon data collected and analyzed within ICOS Sweden.
- The production and handling of metadata must be structured with the person responsible for a measurement across the network also responsible for the metadata for that measurement.
- Hosting the Carbon Portal may be attractive and valuable, but not critical for the ICOS Sweden program. The first priority for ICOS Sweden should be on data gathering, calibrations and handling.

2.1.3 Swedish LifeWatch

Swedish LifeWatch (SLW) is a consortium of six parties with the Swedish Agricultural University (SLU) as host. SLW aims to be a national biodiversity research infrastructure. It shall provide resources

for analysis and modelling of biological diversity for Swedish research groups. The central task is not to produce new data, but to make existing data available in a uniform way, using agreed standards and a common taxonomy. SLW might become an integrated part of European LifeWatch RI, through joining the proposed ERIC. However, SLW will have the capacity to stand on its own if needed.

The SRC decided to support the construction of SLW late in year 2009. However, due to prolonged discussions with the SRC, an agreement on terms and conditions was not signed until June 1st 2011, and the planning and construction phase has been delayed. Currently, the construction phase is estimated to last until 2014. Following that, SLW should be a functioning national infrastructure. The total delay would thus amount to approx. 1.5 years. Funding during 2010-2012 has been in total slightly above 20 MSEK per year. Of this 9 million is from SRC and 2.3 million from the host university. The level of funding for 2013 and 2014 is still not settled, but will be at least 11.65 MSEK per year. The contributions from the host university and the consortium members are either as direct money to the budget or *in kind* contributions in the form of *e.g.* use of personnel.

There are so far no formal users of the infrastructure since it is still under construction. However, several of the databases to be included, such as the Species Gateway (Artportalen), are operational and frequently used, and preliminary results from an on-going survey indicate a large interest amongst potential users.

Organization, leadership and management

The panel met with managing director Ulf Gärdenfors, ICT architect and coordinator Oskar Kindvall and communications officer Anna Maria Wrempe. The Director of the infrastructure was initially planned for 50% of his time but, with the appointment of a communications post within SLW, funding now supports only 35% of his time. The core management group includes, besides the director, another two people: one ICT architect and coordinator (80%) and the communications officer and secretary (50 + 50%). The evaluators find the management group competent, enthusiastic, and complementing each other well, and support the decision to allocate funds to employ the communications officer. However, they have concerns about the limited time the Director spends on the project. A full time or almost full time Director is required, especially at this early stage. It is the opinion of the evaluators that more time needs to be spent by the Director on marketing and lobbying at a high level, to raise the profile and ensure success for SLW both nationally and in a European network.

The Board appears supportive, but has so far not had to deal with any truly critical issues. In the future, the Board will take decisions on *e.g.* allocation of the budget based on the development needs of the SLW.

Results and outcomes

As the SLW is still in a construction phase, activities during the first year have focused on preparatory actions such as completing contract agreements, recruitment of staff, formation of the management structure and establishment of working groups. Regarding the technical development, key deliveries have been the user administration system, tailoring the taxonomic system (Dyntaxa) into the SLW platform, and the new version of the Species Gateway (Artportalen). On-going activities are expected shortly to deliver new generations of Dyntaxa and Species Gateway as well as web services, most importantly the Analysis Portal. So far, there are no direct outcomes from the infrastructure in the form *e.g.* publications using data obtained from SLW, but according to plans data users will be encouraged to use a reporting function in the Analysis portal, with the incentive of getting the work announced. Publications will also be traced actively by SLW.

The value added of SLW as a national infrastructure relates at the moment essentially to the provision of free and easy access to key biodiversity-related data in one platform. SLW has identified key biodiversity data repositories and has prioritized its activities to ensure access to that data. In the view of SLW, there would be additional value in the direct access to larger amounts of data on a European level. This possible development would also mean joint activities and shared development costs by more partners. Integrating with the European-wide research infrastructure would also facilitate a wid-

er range of scientific contacts for the Swedish research community. So far, international linkages have emerged at the Nordic level, in the BioVeL (Biodiversity Virtual e-Laboratory) that develops workflows for LifeWatch as well as the EU BON (European Biodiversity Observation Network). With regards to other on-going international activities, the Global Biodiversity Information Facility (GBIF) focuses also on biodiversity and especially legacy data (museum collections). SLW claims to add value to GBIF by providing access and new tools to use efficiently the data collected and stored by GBIF nodes.

The evaluators view these international collaborative efforts very positively. However, the evaluators would yet like to see the roles of GBIF and SLW further clarified at the national level. The evaluators believe that SLW has a potential to significantly improve the use and access to standardized, high quality biodiversity data. The development of tools for analysis and presentation appears to reflect user needs, and will have a high potential for improving both scientific and societal impacts. However, closer integration with European LifeWatch and other international initiatives will provide access to broad sets of data, facilitate new linkages to the international scientific community, and raise the profile of Swedish research in this area.

The evaluators would like to see a risk analysis included in the operational and strategic plans of SLW, in addition to the SWOT analysis in the self-evaluation.

Accessibility

SLW data will be freely available through internet portals providing access to data sets and analytical software. The target audiences include academic researchers, undergraduate and Ph.D. students, biologists, conservationists, natural history scientists, museums, consultants, planners, government agencies, non-governmental organizations, and “citizen scientists”. Academic research requests will take precedence over commercial activities when prioritizing is required.

At present, there appears to be adequate computer capacity and appropriate software to handle data requests, although some transfers may be slowed due to differing standards and formats between data sets. A bottleneck in data access will occasionally occur for user training needed by some customers to operate sophisticated processing and analytic software. The evaluators consider that these issues will be no more than a minor annoyance.

There will be some restrictions on access to data on rare and endangered species. Open access to new data may also have limitations due to decisions by researchers/data providers. The evaluators want to stress that time limit rules and recommendations for restrictions on open access need to be clearly stated as part of SLW data access policy.

It is the opinion of the evaluators that the SLW program has in place an excellent infrastructure with the requisite computer and software resources to fulfill its goal of providing biodiversity data combined with GIS mapping, visualizations, modeling, metadata, and support manuals to produce world class research.

The evaluators strongly recommend that SLW coordinates with Swedish ECDS to avoid duplication of efforts, and with European programs such as the European LifeWatch, EU BON and GBIF to leverage access to additional data sources.

Collaborations

The SLW consortium has six nodes. The partners have worked well together with few tensions. The funding to date of each node was agreed at the start of the Agreement but the Board will need to make decisions on future funding allocations. The main challenges have been to get the nodes thinking ‘outside their own box’, for example to overcome the different traditions of software usage that can hinder intercommunication. The key to success is based on specifications that are independent of software. The absence of collaboration so far with two universities (Stockholm and Uppsala) with major strengths in biodiversity research is because of their lack of major relevant data repositories, but it is recognised that these two universities will need to be involved as key collaborators in the future.

SLW has been engaging with ECDS and has a representative on the ECDS Board. There is agreement to combine tools and services so that metadata from SLW datasets can be provided to ECDS. SLW recognises the challenge in getting researchers to provide good metadata.

SLW has not yet made contact with the Swedish parts of other relevant ESFRI projects, such as ICOS. Furthermore, engagement with genomics data is envisaged for the next period.

SLW has been involved in technical discussions with European LifeWatch and has benefited from a flow of information, but it sees itself primarily as a national infrastructure that is not dependent on the successful establishment of the European LifeWatch ERIC. There are effective international collaborations with the Nordic LW group, BioVel and EU BON.

The evaluators are satisfied that the conditions and expectations concerning collaboration between the SLW nodes are being met. In the future, there will be benefit in increased collaborations with other ESFRI projects in Sweden that are relevant to biodiversity and in more active engagement with European LifeWatch.

Efficiency of usage

Efficiency of usage is difficult to evaluate since SLW is still under construction and not yet in operation. However, parts of SLW (*e.g.* Species Gateway) are in active use and there are indications of increasing interest amongst potential users.

SLW has presented some development ideas regarding means to obtain user information. For example, it has reallocated resources to communication activities. There will be further development to communicate with *e.g.* Swedish universities the potential of SLW for both research and training. SLW seems to be open to discussion and willing to learn from user experiences, views and suggestions for the further development of new tools for data analysis and presentation. Regarding training of users, SLW aims to contribute to PhD training through lectures and demonstrations of data base tools and analyses. The evaluators stress the importance of this, and suggest an increased allocation of time, money and personnel for training programs for users.

The role of the host university

SLW seems to operate with the necessary independence from the host, the Swedish Agricultural University (SLU). SLU also hosts the Species Gateway, which will provide SLW with essential data. The university appears very supportive, and makes a substantial contribution to the budget of SLW. This amounts to approx. 7 MSEK/5 years plus in kind contributions, according to the agreement.

Conclusions

The evaluators view SLW as a critical national infrastructure development for biological, ecological and environmental research fields. SLW has been active for its first construction year, and has been able to perform well in many areas. However, it is hard to evaluate how well the international path is embedded in the activities; this will be of key importance for the future positioning of SLW as part of the European research infrastructure. Should the need arise; SLW could also stand alone as a valuable national infrastructure. Engagement with ecological and genetic data providers would be a major step for uplifting the activities and services as well as broadening the potential user community of SLW.

The panel's recommendations

Recommendations to the Swedish Research Council

- The Infrastructure should be required to undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans. Detailed guidance should be provided by the SRC to the infrastructures.
- The terms and conditions document for future agreements should take into account the lessons learnt from the SLW experience.

Recommendations to Swedish LifeWatch

The evaluators are in general pleased with the status and current rate of progress of SLW. However, there are some aspects that could be improved:

- The time allocated to the infrastructure by the Director needs to be increased to full time, in particular to increase efforts in marketing and lobbying at a high level.
- SLW should undertake, and maintain, a risk assessment that includes an account of mitigation measures, and this should be reported in the strategic and operational plans.
- SLW should build a roadmap for integration with ecological, genetic and environmental research data of relevance for biodiversity information.
- The evaluators recommend SLW taking a more active role in developing collaborations with other national infrastructures of relevance.
- The respective roles of GBIF and SLW at the national level should be further clarified.
- The time limits for restrictions in open access need to be clearly stated.
- The evaluators suggest an increased allocation of time, money and personnel for training programs for users.
- The evaluators would like to see an increased effort and allocation of funding to capture small (and maybe esoteric) datasets, at least to the extent that a potential user can be directed to them.

2.2. Reports from Panel B

Panel B has evaluated BioBanking and Molecular Resource Infrastructure of Sweden (BBMRI), Bioinformatics Infrastructure for Life Sciences (BILS), Chemical Biology Consortium Sweden (CBCS) and the Swedish National Infrastructure for Large-Scale Sequencing (SNISS).

2.2.1 BBMRI

BBMRI.se is a national Swedish biobank infrastructure addressing important needs in medical and health sciences by pulling together biobank operators with access to important patient cohorts and other study materials throughout the country. A major national-level planning preceded the start of the RI in 2010. However, finalizing a broad participation of universities is still undergoing, and signing a consortium agreement is expected by the end of 2012. BBMRI.se aims to put together scattered resources by assembling a national biobank (a large collection of blood samples), by developing uniform sample handling and storage protocols and by cataloging molecular analysis resources. BBMRI.se also provides advice in issues pertinent to ethical and legal aspects of the planned projects. The overall funding for 2010-2014 is 148 MSEK from SRC, 30 MSEK from the host KI, and some smaller amounts of other funding. The majority of the specific funding for this RI is at present used by the Stockholm Hub and the Uppsala Node, but some funding is also allocated to the four other nodes. There is no clear picture of the total investment in this RI in terms of the investments of other partners than the host as money or in-kind. Different user numbers were stated in different parts of the reports, ranging from 24 users (who paid for the services) to 121 total research projects during 2011. However, the leadership of the RI was not clear on the definitions of 'a user' to be reported.

Altogether, this is an essential RI, but still under construction.

Results and outcomes

2011 is the first full operational year of BBMRI.se, resulting in 28 peer-reviewed articles about biobanking. A system to track publications from the users still needs to be set up. About 15-20 articles per year are expected as an outcome. The RI's new sample handling services is developing nicely and has begun to impact collection of clinical materials; especially breast cancer and prostate cancer studies have become users of the RI. Links to other clinical analyses as well as genetic studies are combined with

these sample collections, and already new gene associations have been identified and high-level publications are expected as outcomes. Moreover, two new collections, in multiple sclerosis and rheumatoid arthritis, have been initiated. This RI has been the first national node of the pan-European BBMRI to be established, and Sweden is participating in the BBMRI-ERIC process. BBMRI.se can be expected to have marked societal relevance in terms of improved use of clinical and genetic data for identifying disease risk factors, in providing support on ethical and legal questions, and in improving the long-term planning and cost-efficiency of biobanking studies in Sweden and in the international context.

Organization, leadership and management

The panel met the RI Director Jan-Eric Litton (KI), the Deputy Director Joakim Dillner (KI) and the Biobank Manager Mark Divers (KI).

The relationships between the different governing bodies of the RI are somewhat unclear. According to the operative management interviewed the Executive director reports to the external Governing Board, both appointed by the host university. In addition, there are two advisory bodies reporting to the Executive Director: the Scientific Advisory Board (SAB) and the National university assembly. The National university assembly also reports directly to the Governing Board. Considering that only 3 out of the eight Work Packages (WPs) are led by representatives of two of the other nodes, the role of the Executive Director may perhaps appear too dominant relative to the Board and the Nodes to ensure an ownership by the other nodes. It would have been helpful for the panel to meet the Chairperson of the Governing Board as a part of the interview to explore these issues.

The SAB is to have its first meeting in September 2012. When questioned about the SAB process, the plan was for the top leadership and - possibly - the WP leaders to be interviewed. The question is if this is a process that creates a feeling of real participation in the other nodes? The SAB should have direct reporting relationship to the Governing Board that in turn should be responsible of the general strategic directions of the RI. The operative leadership perceive the role of BBMRI.se in doing research, mainly in standardization, and development of the biobanking practices, they are then able to provide state of the art service to the users. The approximate division between R&D and service they estimate to be 50-50 at the moment. The main body of the scientific research remains with the users. This is a good strategy, however, it remains open how the RI can follow up the publication and other output of the users.

Accessibility

This RI is in transition whereby *e.g.* the current webpage is mainly directed to the WPs, not sufficiently towards potential users. The results of the user survey were disappointing with only 6 replies from a total of 24 users reported. The RI is however already responding to the need of a better user interface by launching a new user-oriented website in October. They also have a regular electronic newsletter, hands on training courses and an international biobanking summit that attract large numbers of participants including key international biobanking organizations. The access organized to the physical biobank materials, and the data produced is well organized within the ethical and legal constraints prevailing. Clear and transparent procedures for prioritizing between projects are not in place yet, however, the guidelines are that large projects of national importance and high technical quality in sample collection have priority.

Collaborations

Two years after starting to build the RI, the consortium agreement is close to signature. Two of the partners are already committed, another three are close to reaching a decision by the end of this year. The attractiveness of the RI has improved as the competitors have realized the added value in the cost efficiency of sample handling. The leaders of BBMRI.se understand that a mandate for such a coordination function needs to be earned by interacting with the users and collaborators. A further question will be the building in the large hospital network in Sweden to this RI, an important but complicated task. This RI and its operators have gained significant international recognition, especially in develop-

ing standards for biobanking and bioinformatics based handling of data. For example they are leaders of one of the WPs of BBMRI-ERIC. The current consortium also coordinates a Nordic BBMRI.

Efficiency of usage

The way the users are reported is confusing and making it difficult to evaluate the efficiency of usage. This could be at least in part because of the early phase of the technical development of the RI.

There are some links to other Swedish infrastructures and the different national life science infrastructures have initialized biannual meetings.

The role of the host university

The host university, KI, considers biobanking of highest strategic importance both nationally and for the university. KI only plays a formal role in appointing both the Director and the Governing Board. It remained unclear how the representatives of the Governing Board were selected, and whether the participating nodes were consulted upon potential candidates.

Conclusions

This is an important distributed RI that requires an even more long-term commitment than many of the other RIs. The distributed nature is integral to the biobanking concept, emphasizing the importance of good collaboration as well as division of labor and responsibilities between the different nodes. The RI has made important steps towards engaging the larger biobanking community towards developing joint collections, harmonization of procedures and improving the cost-effectiveness of this type of RI. Expectations of the Swedish research community were seemingly met. BBMRI.se played a fundamental role for the European BBMRI which would be unthinkable without the Swedish input.

The panel's recommendations

Recommendations to the Swedish Research Council

- The procedures for ensuring sufficient engagement of the participating organizations of the BBMRI.se in appointing the executive level and the distribution of powers between the different governing bodies must be seen over in the Terms and Conditions document. The procedure of the user survey needs to be reconsidered regarding reaching the users and timing of the surveys to make sure that a significant percentage of the users will reply.

Recommendations to BBMRI

- Performance indicators must be developed in order to follow up the scientific output based on this RI in terms of publications, impact on the health care system etc. It is strongly recommended to systematically request acknowledgement of BBMRI.se in publications relying on support of this RI.
- Once the partners have signed the contract, procedures should be put in place to get a more comprehensive picture of the entire budget of this RI, including that of the other partners than the host.
- The concept of 'user' should be defined and the statistics collected accordingly to allow a proper analysis of the accessibility and user distribution of the RI. More emphasis should be put in organizing workshops for the service providers themselves and with the users to increase the sense of ownership and shared goals within the RI.

2.2.2 BILS

Bioinformatics Infrastructure for Life Sciences (BILS) is aiming to provide bioinformatics competence, long-term data storage, computational resources as well as access to data and analytical methods to support life science researchers in Sweden. BILS will also match Nordic and other European efforts, it will be the national contact point towards the Pan-European infrastructure for biological information,

ELIXIR, and related international collaborations. The focus of the ELIXIR contribution will be on unique Swedish data resources such as the Human Protein Atlas and NGS data, and on bioinformatics tools developed and maintained in Sweden.

The funding for this RI from SRC is currently about 14.5 MSEK (2012) with 2.69 MSEK of additional funding from the partner universities. BILS has a staff of 27 persons (30% female, 70% male) in the fall 2012. The BILS staff at each node is co-financed by the host university (university paying up to 50 % of position or paying overhead costs). In a few cases BILS staff is funded 50 % by BILS for giving support and 50 % by Host University for research. This RI has a good national distribution of users supported by a distributed infrastructure. Consulting takes up over half of the activities by BILS (over 50 projects reported), infrastructure (including *e.g.* mass spectrometry proteomics data storage, analytical pipelines for large-scale data analysis within genomics and metagenomics, work on BILS web pages) takes another 30% and the rest is divided between training (courses and workshops), meetings and own education.

Results and outcomes

The RI is still starting up, with the Board and SAB in place just recently. Importantly for a distributed structure, the RI has recently implemented a project management system where BILS staff reports their ongoing projects. This will facilitate the follow-up and annual reporting as well as gives the BILS staff an easy access to all ongoing projects. BILS is contributing to scientific progress in Sweden by providing state-of-the-art bioinformatics tools for the life science community. It is also acting as a link to the European collaboration within ELIXIR and the Nordic countries with great similarities in type of (clinical) data and with very good data connections. There are already concrete examples of large-scale projects where BILS has had a significant impact. Industrial representatives are invited as members of the Board, including the Chair, helping to maintain a dialogue and to plan actions to increase on the societal and industrial dimensions of the work of BILS.

Organization, leadership and management

The panel interviewed the Chairman of the Board, Niklas Blomberg (AstraZeneca); Director, Bengt Persson (LiU), and the Technical Coordinator, Mikael Borg (SU).

This is a highly distributed infrastructure which is well organized and managed with the Board being responsible for the overall strategic priorities and a high level international Scientific Advisory Board reporting to the Board. Communication is transparent with minutes of the Board meetings being openly available in the BILS homepage. The operative leadership consists of the Director supported by the Task Coordinators, concentrating on the day-to-day work. There is also a reference group functioning as a communication channel with user representatives in different Swedish universities. There is a clear focus on people (instead of *e.g.* processes and equipment) and the management and the persons responsible for the different services are easy to find on the home page. Additionally, the Director is a member in a national Bioinfrastructure Coordination group that is formed to discuss priorities and division of roles and responsibilities among the different national life science RIs in Sweden; an admirable bottom-up initiative towards overall national coordination of efforts.

The current staff is 27 persons, generally roughly 50% co-funded by their respective host universities. The well-motivated strategy is that the RI staff will also do some research in addition to service in order to keep up with the state-of-the-art in bioinformatics; the current quota is about 20%. To ensure good internal collaboration and coherence of the RI, there are regular All Hands -meetings with all of the BILS staff. There is also one technical coordinator for the entire RI.

Accessibility

The users responded well to the survey (19 users from 6 universities replied out of a total of 28 users reported) and were generally happy with the quality of the service. The two issues that have remained unclear to the users were the evaluation process of the project applications and the conditions of accessibility of the data. Few users reported having participated in training provided by the RI, and the

information about the training events and meetings are not yet efficiently reaching the users. BILS is responding to this need by BILS users by holding regular presentations at the universities, by launching a common support system (<http://biosupport.se>) and by accepting support cases via E-mail. However, the most common contact route for life science researchers is still telephone and/or personal visits. Also, an annual BILS workshop and user meeting is forthcoming in October 2012. There is a process in place for prioritizing projects but scientific quality/potential should be added more clearly as an element in this process.

Collaborations

The national network operation is functioning well between the BILS nodes, and the spread of users is in all major Swedish Universities. BILS is active in the coordination group of the SRC-funded Swedish national RIs. There is some emerging interaction with the SciLifeLab. The international networks are excellent.

Efficiency of usage

There seems to be a good level of usage and no apparent limitations for using and accessing the RI. BILS is investing a large amount of resources to interpret data, which is important for educating users. There are issues with computational and storage resources and this is addressed by collaborating with the SNIC centres (UPPMAX, NSC). Better coordination of activities and collaboration with the SciLifeLab and the associated WABI personnel could further improve the overall efficiency of bioinformatics services in Sweden. BILS estimates that considering the exponentially increasing rate of biological data accumulating, even if combined, the current activities by the various service providers are still not enough to cover the demand of bioinformatics support needed in Sweden.

The role of the host university

The host university in Linköping is willing and able to accommodate the BILS RI as a functionally independent unit with a national role. The director is clearly embracing his role as a national coordinator and a liaison with international activities.

Conclusions

This RI is still in a start-up phase but it is apparent to the panel that it has every chance of meeting the expectations of the grant including the terms and conditions for the RI. This is proven by a good effort in striving towards coordination of the multi-node operation and proper understanding of service functions.

BILS is in a position to contribute significantly to the European bioinformatics plans in the ELIXIR project.

BILS can also be seen as an important operation for small-to-middle sized companies by providing access to facilities and data.

The panel's recommendations

Recommendations to the Swedish Research Council

- It is necessary to consider the potential overlaps and ensure optimal division of tasks and use of funds between several of the infrastructure efforts that form the larger picture of life sciences RIs, including BILS. These include BBMRI, SNISS, SNIC and the SciLifeLab/WABI operations.

Recommendations to BILS

- For future evaluations it will be important for BILS to develop procedures to follow up the scientific quality of projects they are supporting and to ensure that scientific quality and/or potential be introduced as an important element in prioritizing projects.

2.2.3 CBCS

Chemical Biology Consortium Sweden (CBCS) is a national RI providing expertise in the development of chemical probes and access to chemical libraries at two nodes, (KI Stockholm, host, and Umeå), and pharmacokinetic and ADMET services at the third node (Uppsala). The Umeå service has operated since 2006 and the Uppsala service since 2009. KI was recipient of a company-based donation of a collection of chemical compounds, which was used to set up screening services in 2010. The joint national CBCS operation began in 2010. The KI and the Umeå nodes provide broad services using technically and instrument-wise similar screening facilities, but the Umeå node is focusing somewhat more on infectious diseases as well as plant sciences. Working as a national RI has allowed distribution of tasks and balancing the workloads between the two nodes. The Uppsala node nicely complements the other two. Typically the users establish collaboration with the RI operators, as tailored approaches are needed for carrying out the projects. However, in some cases the special facilities have been independently used by customers. Currently CBCS operates under an interesting funding model – all funding from the Swedish Research Council is allocated to KI and then distributed among the three nodes. All three nodes receive additional funding from a variety of sources. In terms of personnel, the KI and Umeå nodes employ 11 persons each while Uppsala has 3.5, altogether amounting to 25.5 persons.

Results and outcomes

CBCS is a national RI focusing on top science in an international perspective. In a short time CBCS has reached an impressive number of users (66 reported by the RI). Altogether 80 collaborative projects (some begun before the joint operation) have been derived from all major academic institutions in Sweden. The selection process of projects is exemplary.

Large-scale chemical library screening has traditionally been an activity carried out at pharmaceutical and biotech companies. By offering expertise and collaboration, CBCS has introduced the concept of screening small molecule libraries to academic research. The interest in this facility by the researcher community has exceeded the expectations and the user survey clearly suggests that CBCS has gained acceptance and trust as a national operator. The CBCS projects have led to the development of novel bioactive small molecules with potential uses in several diseases with unmet needs for therapeutic agents. Also applications in plant biology, such as *e.g.* pesticides, may emerge from the projects. The industry welcomes open access of data which will increase the impact of this kind of RI. This is of particular importance for SMEs. One part of a system to keep track on research outcomes is considered during the prioritisation procedure by the CBCS Project Review Committee, which bases its decision *i.e.* on the publication strategy of the research projects asking for access to the RI.

CBCS has the ambition to consistently assimilate and confirm all data generated, thus assisting the users to interpret and evaluate the total outcome of a project activity. All data are assimilated within the current cheminformatics systems in place at KI, UmU and UU.

In most CBCS projects, the level of involvement of the RI warrants co-publication, which goes on the CBCS website. In cases where an acknowledgement is warranted, CBCS asks for being informed on a continuous basis.

Organization, leadership and management

The panel interviewed the Director Annika Jenmalm-Jensen (KI), and the node directors Per Artursson (Uppsala) and Mikael Eloffsson (Umeå).

The relationships between the different governing bodies of the RI are somewhat unclear. The board informs the host university about its plans but the powers between the RI board, the host university management and the operational management are not clearly defined in the contract, which is causing some confusion. The SAB should be in a consultative relationship with the board not the director. The other nodes should approve the presence of a KI representative in the board.

Strong leadership equally shared by the three node coordinators is evident. This well-functioning management team should be made visible in the organizational structure, since it will build trust in the consortium leadership among the users and potential new nodes. The quality of the projects is significantly strengthened by the function of a Project Review Committee. The PRC should report to the management team. There is good coordination and division of tasks between the three nodes.

All SRC funding goes to KI, whereas Uppsala and Umeå nodes are funded from other programs at present. The long term strategy needs a common funding base.

The KI node will co-locate at the SciLifeLab in Stockholm and will receive additional funding from SciLifeLab. This is an arrangement involving some risk of decreased independence of the RI.

Accessibility

The majority of users answering the survey (more than 1/3) seemed more than happy with the RI. In order to attract new users and to improve the accessibility there should be a more interactive homepage. The idea of establishing “CBCS ambassadors” was unique and it has very clearly already increased the awareness of potential users of this RI. The RI has a good process in place to prioritize the projects by scientific quality and novelty as well as feasibility.

Collaborations

CBCS is accepted as the national resource in its field of science. CBCS is confident that they are internationally competitive and see this as a key element of success also as a national RI. This is also evidenced by their good international collaborations and networks. The RI participates in the EU Open screen project, and the Umeå coordinator is responsible for one of its work packages (in training and education). CBCS is actively contributing to the consolidation of the Nordic Chemical Biology Network. CBCS has succeeded in recruiting internationally leading scientists in Chemical Biology to their SAB.

Efficiency of usage

CBCS reported to have very happy users, which is confirmed by the user survey. The user community welcomes such a lean and efficient RI for chemical biology in Sweden. Users seem to show a big interest in follow-up studies, which also proves their content. On the other hand, more users than originally expected have emerged and the services are now approaching their maximum capacity. Hence, the prioritization of projects by the Project Review Committee, which is in place, gains importance. The application process and the criteria for prioritization are already available. In view of larger component collections, the RI would like to invest in more efficient equipment and increased automation of the assays as such investments would also serve to reduce the reagent costs. The RI is also planning to meet the need for increased capacity by consideration of affiliating nodes, possibly a setup in Göteborg.

CBCS realizes that the outreach activities could be improved. CBCS plans good initiatives to get a better geographic spread like a rotating symposium which visits universities all over Sweden.

The RI has chosen a collaborative mode of interaction with scientists from the users working on-site the RI nodes. This is very good for the educational perspective but labor intensive, which should be taken into account in resourcing this RI.

The role of the host university

CBCS reported that KI as the host university is supporting the RI as required by the “Terms and Conditions”. The management (coordinators of the three nodes) does not experience pressure from KI concerning independent running and future planning of the RI. The organizational chart will be adjusted to reflect the mandates of the different organizational bodies.

Conclusions

CBCS has in a short time gained a national user community in the area of chemical biology by making available traditionally pharmaceutical industry-based small molecule libraries for high-throughput screening of bioactive substances. The users indicate their strong support for this expert service activity.

Clearly, this RI serves previously unmet needs in the Swedish researcher community. Moreover this RI has clear industrial potential. Importantly, the RI has excellent international links. These include participation in the preparatory phase of one of the ESFRI roadmap infrastructures, EU-open screen, participation in the emerging Nordic chemical biology co-operation, which coincides with the Swedish (Umeå), Finnish (FIMM) and Norwegian (Oslo) EMBL nodes in medicine, and other international links.

The coordinators of the three nodes were highly motivated in building and running a national RI, and they demonstrated excellent understanding of each parties' roles in the common organization. CBCS presented a balanced SWOT analysis also including an evaluation of how to cope.

The panel's recommendations

Recommendations to the Swedish Research Council

- The "Terms & Conditions" should be reconsidered to be clear on the specification of powers of the Governing Board, the Scientific Advisory Board, the Director, a Management Board assisting the Director, and the host university's leadership. As a national facility, independent operation of the RI is essential. These are general comments pertinent to all of the Life Science RIs evaluated by the Panel B.
- The formal link of the KI node of CBCS to the SciLifeLab program needs to be carefully considered in view of the success of CBCS as a national RI with high user acceptance. A national RI cannot operate under two different funding schemes and governance. SRC should have a discussion with CBCS and SciLifeLab on how this collaboration is best organized.

Recommendations to CBCS

- The organizational structure needs to be clarified with respect to the roles of the Governing Board in relation to the host KI.
- The panel supports the plans by CBCS to increase the capacity and cost-efficiency of their services e.g. by streamlining and automation of their assays. These developments would justify some increase in manpower. Moreover, the possibility of annexing one or two carefully selected nodes to the national network is a very good idea as long as the distinction between national service and local operation remains clear. Critical mass and international visibility is essential.
- The current financing structure of the CBCS relies on two of the established nodes (Umeå and Uppsala) finding funding from other grants the newest node at KI receives all of the SRC national infrastructure funding. This cannot be the long-term solution and a funding scheme beyond the current period has to be planned accordingly.
- Performance indicators should be developed to allow assessment of the value of the RI.
- The current homepages are good, but they would further benefit from addition of interactive components to them.

2.2.4 SNISS

The Swedish National Infrastructure for Large-Scale Sequencing (SNISS) was formed in 2010 as a national core facility for massively parallel sequencing open to all Swedish groups. SNISS comprises two nodes, KTH and Uppsala University. This joint RI is preceded by KTH and Uppsala sequencing facilities existing since the end of the 1990's and also included in the SciLifeLab, a separately funded centre founded by three universities in Stockholm and one university in Uppsala for large-scale research in bio-science, medicine and environment. The two nodes have built different equipment profiles, which allow them to provide, in part, complementary services. The KTH facility has also a visiting scientist program with bookable laboratory, office space and accommodation supporting short-term visits to the facility. The funding of SNISS (excluding capital investments) is primarily derived from SciLifeLab (70 %), while the SRC national infrastructure program contributes 25 % and host university (KTH) 5 %. Thus, the Swedish Research Council is presently providing only a part of the funding for its national in-

frastructure. SNISS reports a large user base of 117 (including 55 new users) and over 200 projects for 2011. In terms of user demography, few universities outside Stockholm and Uppsala appeared among those responding to the user survey. The user statistics reported by the RI confirms that users from the Stockholm and Uppsala use at least 70 % of the capacity, followed by Umeå University and significantly smaller quotas for other Swedish universities and institutions. There were however some industrial users.

Results and outcomes

The sequencing services at SNISS – apparently counted as a part of SciLifeLab - have grown hugely since 2010. The number of samples was at the level of about 400 hundred in 2010, but already in 2011 there were 3000 samples and close to 4500 is predicted for 2012. This growth is expected to continue. The RI is also engaged in technology development also impacting practices in similar facilities abroad. SNISS has a reporting system in place for acknowledging its services in publications, and methods for tracking publications with use of the services are used.

The number of publications is quite good for this type of service (at least 57 published). 50 % of the service capacity is used for sequencing of human samples while the other half encompasses a wide range of organisms ranging from microbes to plants. With such a generic infrastructure broadly serving medicine and biological sciences, the highlights of results cover a number of research areas, including many medical topics ranging from cancer genomics to transcriptomics. A particularly challenging project has been the *de novo* sequencing of the spruce genome, which is 10 times as large as the human genome. All in all, it is clear that this RI contributes significantly to disease gene mapping, genome analysis of pathogens and elucidation of novel genomes. The applicability of the ensuing data is evident in medicine but also in environmental sciences.

Organization, leadership and management

The panel interviewed the Chairman of the Board, Petter Gustafsson (Umeå), the Director of the Stockholm node, Joakim Lundeberg (KTH), and the director of the Uppsala node, Ulf Gyllensten (Uppsala University).

According to the Terms and Conditions document this RI only receives less than 5 MSEK annually from SRC and an additional 2 MSEK from the host university KTH (excluding capital investments). With this funding it is expected to run a national RI that operates independently of the host university. The RI is presently heavily cofounded by the SciLifeLab operating under different governance. All these different funding sources result in the fact that the management structure is more than unclear. Both the role of and the relationships between the different governing bodies of the RI remained unclear to the panel as well as to the Chair of the Board (according to his own observation). The Chair of the board looks forward to a clearer mandate in the future. The board, which so far only met twice in person, is composed out of 5 Swedish scientists but it is not clear how they were selected. Transparency in this issue would be important for the buy-in of new users of this national infrastructure beyond Stockholm and Uppsala. A review panel (of only 2 international scientists) evaluates project proposals. The SAB - shared with SciLifeLab - has also got only 2 members, albeit internationally leading. Since 70% of the budget is funded by SciLifeLab (in contrast to only 25% from SRC and 5% from the host university) the flow of decision-making seems rather critical. There remains a detrimental risk to the sustainability of the RI since the SciLifeLab funding is only granted on annual basis. During the interview, the RI management disclosed that they are planning to amend the governance described in the information provided beforehand by creating a new structure designated as the National Genomics Infrastructure as of Jan. 1st 2013. It seems critical that the roles and mandates of the governing bodies of both within the RI and as well as between SNISS and the SciLifeLab concerning both the strategy and flow of resources are made clear. Low level of bureaucracy is desirable but not at the expense of clarity and transparency.

Accessibility

The large user community of SNISS welcomes the largest and best equipped MPS sequencing facilities in Sweden. Providing high quality and expedient genomic analysis is mirrored by the level of utilization, output and performance. However, the response of the users was the lowest of the RIs handled by this panel (30 respondents out of the 183 user reported). The range of the responses, from very happy users to very unsatisfied scientists, was the most distributed one. Access to data seems well arranged. Among the responders there was criticism about long waiting times. More than 30% reported limitations in gaining access, which is an alarmingly high number. There was also criticism that the two nodes are competing with each other. At least the balance of the work load between the two nodes does not seem to be optimal. Training provided by the RI received low participation numbers. Some PIs felt being left with unfinished projects. Altogether, these are signals of user-experienced problems that need to be systematically dealt with in order to build a strong brand for this RI as the national RI for Genomics in Sweden. SNISS explained the low response rate of 16% with the possible explanation that the user survey was sent out to the PIs. Hence there is no clear picture of a definition of the user.

The current homepages are good, but they would further benefit from addition of interactive components to them. The creation of a better common web portal could improve the outreach presentation.

Collaborations

Probably because of overcapacity in the past, SNISS did not address the overall picture of a national RI in genomics. Participation in (international) research projects is done by the nodes rather than applied for by the RI itself. Collaborations are evident with Umeå University and the SLU in Umeå beyond those within the two nodes of SNISS. SNISS is participating in a number of EU projects, and based on the directors' self-assessment, SNISS is among the five largest sequencing centres in Europe. It is not clear if SNISS as an organization is participating in the EU projects mentioned as a service resource or if it is the users using the services of SNISS that participate. ESGI seems to belong to the first category. SNISS does not participate in the biannual meetings of Swedish BMS-RIs since SNISS is not invited and hence nobody of that RI knew about these meetings.

Efficiency of usage

It looks like the combined capacity of SNISS and the genomics platform of SciLifeLab is almost entirely in use but it is not clear whether the capacity is used to support the best projects and individuals. The criteria used for prioritization of the projects are not clear to the users and it is not evident how scientific quality and potential come in as criteria for choosing projects. Large and ambitious projects should be prioritized and the focus should be on more difficult projects in an international perspective; large numbers of smaller projects involving standard sequencing should rather be done at local level. Better networking with the other national RIs could improve the overall efficiency, raising the question if new nodes could be added involving similar sequencing facilities in *e.g.* Lund and Gothenburg? In particular concerning the increasing needs of bioinformatics support, it should be explored whether a better coordination with BILS would make the overall national effort more efficient.

The role of the host university

In light of the complex relationships between SNISS and the SciLifeLab, the role of the host university (KTH) is not clear. This is elaborated in the section Organization, leadership and management.

However, the representatives of the two nodes reported that, so far, they felt no pressure of the host university.

Conclusions

There has been a revolution in the development of sequencing technologies, and the special funding allocated to SNISS and its predecessors over a period of over 20 years has allowed Sweden to keep up with the rapid international development. The services have had and will continue to have an immense impact on the development of medical and biological sciences. SNISS is a two-node infrastructure, and

it has gained a significant user base, albeit largely at the host university cities and as a part of the SciLifeLab. The need for this type RI is clear and the productivity of the RI is impressive. Continued coordination of efforts between SNISS and SciLifeLab, but equally important, other national RIs will be essential in order to guarantee sufficient and cost-efficient future support to the life science research community in Sweden; it is noteworthy that SNISS has so far apparently not been part of the National Bioinfrastructure Coordination group. Indeed, SNISS is planning to further develop the current setup into a national genomic infrastructure, with a new name and improved palette of services, hopefully also with better national coordination of and collaboration with other national RIs or potential new nodes or RI's. This is an urgently needed reform. The plans include building a common web portal for access (until now, the nodes still have separate portals), strengthen the interaction with other infrastructures, increased support for researcher groups and a plan for sustainable long-term funding. There is a need for more personnel, a predictable and sustainable funding scheme for investing on sequencing instruments (significant funding from KAW was received in 2012, but regular renewals are needed) and on the computational infrastructure. The key question here should be whether to expand only on the current nodes or whether to increase the number of nodes in different parts of Sweden to build a coordinated joint infrastructure with appropriate tiers of service activities.

The coordinators of the two nodes were highly motivated in building the RI. Moreover, the Executive Board can be anticipated too and indeed should strengthen the strategic planning of further developments of SNISS. Significant pressure to increase bioinformatics and computing resources are a major issue. Now the facility produces an average of 80 Gbp/day, equivalent to 30 times the human genome. SNISS data are stored at UPPNEX, the computational centre at Uppsala. Links to BILS, the national bioinformatics RI, are presently not very strong and could perhaps be strengthened for higher capacity and efficiency of the national effort.

The panel's recommendations

Recommendations to the Swedish Research Council

- It is apparent that the exponentially increasing capacity of high-throughput sequencing has led to a rapidly expanding user base, and huge potential to speed up the scientific development in the Life sciences sector. It is equally apparent that the current services in Sweden (probably world-wide) are approaching the end of their capacity. In this light, the prioritization of projects based on scientific quality and potential in addition to technical feasibility, ensuring efficient operation and coordination of the current efforts, increasing local sequencing capacities for standard sequencing as well as increasing the number and volume of the national service units will all need to be considered to meet future service needs.
- A more stringent supervision and guidance by SRC regarding the organization of the RI, specification of the powers allocated to the Executive Board, the Scientific Advisory Board, the Director, a Management Board assisting the Director and the host university's leadership, is required. As a national facility, independent operation of the RI is essential. These are general comments pertinent to all of the RIs.
- The national operation would significantly benefit from clear and formalized links to the SciLifeLab program; the links are already in place, but under separate governance. Ideally a joint operation serving the entire country should be established, possibly by adding nodes in other parts of Sweden in addition to increasing the capacity of SNISS.

Recommendations to SNISS

- The need for this type of RI is clear, but the national over-all structure is not fully developed at this point. The vast majority of the projects performed are small. It may reflect a pilot phase of projects, which will lead to more challenging projects in the future. To a significant extent this is also likely to reflect overloading of the national facility with "ordinary" projects, which may not necessarily warrant use of a national facility. Hence, for the future development it is important to plan a suitable

balance between the national service and local sequencing, which will be needed at several institutions. The national service should focus on large-scale projects, demanding and difficult projects of high scientific value.

- Moreover, the division of tasks of the two nodes now forming SNISS should be more clearly described and bottlenecks in the services should be solved.
- Of major importance is the integration of the sequencing data with storage of the information and data analyses. Here a plan for division of tasks between SNISS, BILS and SNICC should be made. To identify the various tasks a matrix like in the ESFRI BMS Report 2012 (p. 71 or 105) could be helpful. Upon request, a copy of the BMS Report will be sent to the Chair of the board.
- A plan for sustainable funding is needed. Clarification of the roles of SciLifeLab and WABI is necessary relative to SNISS. What parts of SNISS are national and what locally serving. The governance structure with respect to two funding schemes, SRC national infrastructures and SciLifeLab, also needs clarification. It does not make sense to have an overlapping structure in terms of judicial use of funding, and towards the user community the superfluity of organizations is unmanageable.
- Performance indicators should be developed to allow assessment of the value of the RI, in particular showing its impact on research projects of the highest international status.

2.3 Reports from Panel C

Panel C has evaluated, the Max IV laboratory, MyFab, the Partnership for Advanced Computing in Europe (PRACE) and SuperAdam.

2.3.1 MAX-lab

MAX-lab was inaugurated February 1987, became a National Laboratory at Lund University in 1994, and in July 2010 became part of the MAX IV Laboratory. The founding bodies (Swedish Research Council, VINNOVA, Region Skåne and Lund University) agreed on financing the construction of the MAX IV accelerator complex in 2010. This has been accompanied by significant changes at all levels for the national facility MAX-lab. In October 2010 the MAX IV Laboratory got a new Board appointed by Lund University in agreement with the other funding bodies.

The MAX IV Laboratory is intended to meet the long-term needs for a Swedish research infrastructure for synchrotron light and energy-rich electrons. The MAX IV Laboratory includes two components: the present MAX I-III storage rings (referred to as MAX-lab) and the construction of the new MAX IV facility; this review focused on the existing operations and the plans managing the transition to the new facility. Lund University (LU) is the host university for the MAX IV Laboratory.

The Swedish Research Council awards funding to LU to operate MAX-lab and to develop the MAX IV Laboratory as a national research infrastructure aimed at providing expertise concerning synchrotron light and high-energy electrons. LU acts as employer, provides administrative services, and has financial responsibility for the facility including substantial operational costs. As part of the agreement between the Swedish Research Council and Lund University, LU covers the rent of the buildings used by MAX-lab and the associated costs of electricity and water and also provides a number of administrative services. During 2011 and 2012, the Swedish Research Council has funded MAX-lab with 165 MSEK. The total contribution from LU to MAX-lab exceeds 30 MSEK/year.

Results and outcomes

A major breakthrough has been the developments leading to the concept of MAX IV, which break the “chromaticity brick wall”, previously preventing radical performance increments of third generation storage rings. The pioneering ideas have been recognized as essential in creating high performance storage ring based light sources. This development is closely followed at major synchrotron light facilities world-wide and intensive studies are underway to explore the concept at several synchrotron facilities.

Since last year, MAX-lab introduced the Digital User Office (DUO) in which users, at any time, can upload a new publication to the database in the DUO system. They rely on input from users of the facility to keep the publication list complete and up to date. The experiments at MAX-lab lead to around 200 scientific publications every year in scientific journals and books. The users provide summaries of their results that are available at the website. About 5-10 of these publications are in top-ranked journals of the respective fields and represents major breakthroughs within specialized areas. In short, MAX-lab is a very productive infrastructure, averaging about one publication for every day of operation.

Management, organization and funding (apart from funding from the host university)

MAX-lab is an impressive research infrastructure with a well-defined set up and the panel feel that the management arrangement is very good, led by a capable, enthusiastic director. All important management structures, including a board and committees, are in place and function well. MAX-lab is currently fully integrated in the University of Lund. For the future (MAX IV) there are plans to become a legal entity, preferably a European Research Infrastructure Consortium (ERIC) with co-funding from European countries. Collaboration with ESS is already in place.

The challenge for MAX-lab is the transition to MAX IV, which has already been planned in some detail and will include an overlap of about 6 months. The difficulty lies in the fact that something which currently works well needs to be balanced against the need for expansion and enhancement. The move of some of the beam lines will definitely disrupt operations.

The panel is impressed by the way the larger MAX IV Laboratory is being developed by hiring temporary assistance from international partners and other resources in order to minimize the additional effort of constructing MAX IV on MAX-lab staff.

Accessibility

Over the past two decades, MAX-lab has positioned itself as the synchrotron for Northern Europe, serving not only Sweden but the rest of Scandinavia and the Baltic (and, to some extent, users from all over the world). Access to the infrastructure is completely open, through a proposal process which can be utilized by literally anyone. The review process is clearly defined. There is one call per year for soft X-ray work and two calls per year for hard X-ray beam lines. In addition there is opportunity to gain "fast access" of available beam time when deemed appropriate by the MAX-lab staff. After the proposal call, a feasibility review is done by individual beam line staff feeding an international review panel grading solely on scientific merit. There are 15 beam lines which cover a large set of available techniques in X-ray scattering, spectroscopy and imaging over a range of energies spanning from infrared to hard X-rays. The facility overall is oversubscribed on the order of 30-40 %, which allows a balance between facilitating the best science possible and remaining accessible to a large number of returning and new users. Within Sweden, users come from all over the country, with the greatest numbers coming from major universities. Access to MAX-lab is completely free of charge, provided that the work is open access with the intent to publish. Data is freely available, and is usually taken back to the home institution for analysis after a beam time run. Overall, there is little impediment to access to MAX-lab – if a researcher is doing good science and beam time is available; it is likely they will be able to do work there. As a result, a large number of users have published a large number of publications (nearly one per day) in both the physical and life sciences. MAX-lab has been positioned ideally: as a highly accessible, international infrastructure with statistics and results as evidence of success.

Over the next four years, MAX IV Laboratory will undergo a major planned transformation as the older beam lines are decommissioned and Max IV comes online. It is important that the management do everything they can to ensure that access to the existing MAX-lab infrastructure is without disruption for as long as possible. Of course, there will be some "dark" period, but every step to minimize it will be necessary in order to maintain and continue growing the user community.

Collaborations

The self-evaluation and the hearing described a number of collaborations with Swedish universities and international research infrastructures. The collaborations seem to be directed towards develop-

ment of methods to expand the technological and scientific capabilities in order to fulfill the needs of the international user community. There is also an exchange of personnel involved in the collaborations. This is very satisfactory, and indeed necessary to stay at the forefront and to attract research communities of the highest international quality. The MAX IV Laboratory has several collaborations solidly in place with Swedish universities relating to development of experimental facilities at the current facility. It also participates in European networks of importance for developments in various areas, *e.g.*, MX-CUBE for software development in protein crystallography and the European Detector Consortium Collaboration for development of future detectors. The Laboratory collaborates with Helmholtz-Zentrum Berlin on soft x-ray science and instrumentation, with ESS and Lund University on detector development, with the Technical University of Denmark on development of instrumentation and methods for hard x-ray science, and with the French synchrotron radiation facility SOLEIL on collaborative research and development of instruments at SOLEIL for application to the new MAX IV facility. The new Polish synchrotron SOLARIS being built at Krakow is a copy of the 1.5 GeV MAX IV; a Polish accelerator group of some 10 persons is currently being educated at the facility and is working in parallel with the Laboratory staff.

The panel concludes that collaborations between the Max IV Laboratory and Nordic and other international facilities are in place and that they fulfill the expectations with respect to taking a national role in collaborations and outreach throughout Sweden and Europe. The panel also concludes that the Max IV Laboratory successfully raises the visibility of Swedish synchrotron science world-wide.

Efficiency of usage

MAX-lab is an extremely well-known facility that already supports large numbers of users from all over the world. This is reflected in the fact that most new users arrive by referral from a personal or geographically close contact, which has effectively done the initial “outreach” on behalf of the facility.

Thus, the usage cycle at the facility follows this general pattern:

1. New users who approach the lab already have a good idea that it is appropriate for the intended experiment
2. The user submits an application for a specific beam line and duration, as part of one of the annual/semiannual calls for proposals. Lab staff members assist new users to the extent possible given their time constraints
3. If successful, the relevant beam line manager advises the users of the time slot allocated (typically with 3-6 months advance notice)
4. Prior to arriving on site, the user discusses the experiment plan with the relevant beam line manager
5. When the user arrives on-site (usually at the beginning of a week), he/she receives a handbook covering procedures; staff members provide scientific and technical support as needed

The MAX-lab team provided a clear breakdown of users over the past 20 years. Their summary of user growth, disciplinary spread, and demographics could serve as a model for other RIs. Currently, almost 1000 people make use of the facility each year, approximately one-quarter of them women. They also track publications resulting from the work (approximately 240 each year) and the number of PhD theses based on experiments (35-40 annually). The same web-based system used for managing applications and scheduling also has support for discussions, user feedback, and report publications based on work at the facility. The information is tracked site management, and technical issues passed directly to the beam line managers.

The role of the host university

MAX-lab is in the somewhat unusual position of being owned by Lund University, so this research infrastructure does not have a traditional “hosting” situation. Apparently the relationship with Lund University operates very smoothly. MAX-lab benefits from the university’s large administrative capability, including procurement officers and specialists; the management team reported that, for example, memoranda-of-understanding have been handled quite quickly by the legal office. LU pays for

all power and water at the site (a total bill of approximately 32 MSEK annually). MAX-lab is required to submit a yearly budget to the university, but this is for information purposes only, as LU doesn't interfere in any way with budgetary decisions. Most recently, MAX IV Laboratory saw the need for professional assistance from a trained communications officer; they requested one from LU and an officer was assigned to the facility within a few days.

Conclusions

Overall, the panel recognizes Max IV Laboratory as a highly successful example of Sweden gaining international attention through sound investment in research infrastructure.

The panel recognizes that the management is clearly looking ahead to the challenge of MAX IV, and is taking a well-structured approach to managing the transition and growth. Moreover, the panel notes MAX-lab is currently doing a very good job with limited resources. The panel's concern is that MAX-lab not be penalized with under-funding simply because they have managed admirably under difficult circumstances. Additional resources are called for, in order to increase staffing (see below), and the panel agrees with the urgency of this need.

The panel's main message to the Swedish Research Council is that the budget for 2013-2014 must be settled quickly. Sweden cannot risk the success of Max-IV. In committing to Max-IV, Sweden implicitly made a commitment to keep the current synchrotron going until the new facility is operational and to ensure a smooth transition for both users and functions. This requires additional resources.

At the request of the Research Council, the panel asked about the current level of funding, and the potential impact of both increased and decreased levels. If the budget were to be increased by 20 %, the pressing need at MAX-lab is to hire more staff to support users, as the current staffing levels it's impossible to help new users at the levels they really need. The panel agrees wholeheartedly with this priority. A second high-priority need would be to allocate more staff to explore new fields of study and companies who could potentially become new users. This could potentially generate new funds for the facility. Other unmet needs include staff time to acquire the new competencies that will be required for MAX-IV, and the availability of a contingency cushion to deal with costs from equipment breakdowns and the replacement of aging parts.

On the other hand, if the budget were to be decreased, MAX-lab would be at a severe disadvantage, as they are already operating at a minimal level of funding considering their very large user base. Although the management would attempt to get short-term assistance from the university or other sources, such extra funding could only satisfy a very short-lived crisis. A lower long-term funding would require the closing down of beam lines and services and hence turning away users. However, since most current funding goes to salaries, the only way to reduce expenses would be to reduce the staff and these are the very people who will be critical to the future operation of MAX-IV. The panel agrees this would jeopardize the success of MAX-IV as well as the current infrastructure.

The panel's recommendations

- Given the nature and visibility of this research infrastructure, more structured risk management should be in place, covering threats to funding, staffing resources and equipment
- Make sure that the current management team will be available at least for the next 4-5 years
- Do everything possible to minimize "dark" time during transition to Max IV
- Continue to vigorously pursue outreach activities in preparation for Max IV. Find new sources of users for the new capabilities and high performance expected at the new facility
- Continue to pursue partnerships within Sweden (ESS, MyFab, etc.) as well as worldwide synchrotron communities
- Continue to be a strong advocate for synchrotron science in Sweden
- It is risky to rely on a handbook for on-site procedures and delay safety training until the second or third day on-site. That information could easily be made available on the web, and users could be required to pass a short online test prior to arrival at the site. These are standard practices elsewhere, and provide important safeguards

- The panel has suggested to the Research Council that the usage summary slides from MAX-lab's presentation (pages 4-7 in the PDF file) should be used as a model for how to report user statistics

2.3.2 MyFab

The MyFab vision is stated as “[be] the first choice, world-class infrastructure for micro- and nanoscale fabrication and characterization, enabling researchers and innovators to solve the grand challenges of the future.” Since 2010, MyFab has been the Swedish national research infrastructure for cleanroom based microtechnology, nanoscience, and characterization, funded by the Swedish Research Council, the three participating universities (Chalmers, KTH, Uppsala), and fees from users. In 2012 MyFab is funded with 31 MSEK from the Research Council, 89 MSEK from user-fees and 52 MSEK from the host universities. The physical and managerial structure of this distributed infrastructure has been developed over the last ten years, with increased intensity from 2007.

MyFab is a distributed infrastructure with almost 5000m² of cleanroom space over the three nodes housing state-of-the-art micro- and nanofabrication equipment that are the best capabilities in Sweden and world competitive. In total, MyFab employs 54 highly trained support personnel including 19 PhDs and others with a firm background in industry. Each node maintains its own expert profile: Chalmers MC2 Nanofabrication Lab in Gothenburg provides a microwave and photonic process line and nano and quantum technology process line; KTH's Electrum Lab in Stockholm focuses on silicon and compound semiconductor technologies and nanomaterial synthesis; and Angstrom's Microstructure Lab in Uppsala centers on life science, materials science and thin film technology, and ion beam technology.

Results and outcomes

MyFab hosts a large number of users across a wide range of disciplines, resulting in hundreds of publications and results a year. The general philosophy for MyFab is that the work is fully owned by the users, the infrastructure takes no ownership in the work or the results whatsoever. Because of this, they put no effort into tracking results or outcomes that have taken advantage of their capabilities. The panel recommends that they improve upon this and develop a formal tracking system. The panel also thinks it is appropriate in many cases to request that publications include an acknowledgement that the work was done in the MyFab infrastructure. Of numerous results, the management rightfully highlighted the well-publicized first observation by physicists at Chalmers of the light from a vacuum (dynamic Casimir effect) as perhaps the biggest scientific breakthrough made possible by the capabilities at MyFab. In addition to the large number of scientific publications, MyFab has served as a launching point for multiple spin-off and start-up companies, including: Silex Microsystems which, based on the MEMS technology developed at KTH, has grown to the world's largest pure-play MEMS foundry with more than 190 employees and a turn-over of 35 MEUR (in 2011); IRnova (2007) with high performance IR sensor arrays; and TranSiC (2005), bought by Fairchild Semiconductors in 2011.

MyFab has positioned itself as a European and world leader in micro/nanotechnologies, not only in scientific output, but also with regards to facility management. Over the past decade, nanoscience has become the forefront of many areas of science, from physics to biomedical engineering. The fabrication capabilities at MyFab are the foundation of such work and a state-of-the-art national infrastructure in this area is vital to Sweden's ability to do research and compete in this area.

Management, organization and funding (apart from funding from the host university)

The panel met with MyFab director Thomas Swahn, MyFab steering group chairman Hans Hentzell and Dag Winkler representing MyFab's host university. The panel feels that the management arrangement at MyFab is very good, with a very capable and enthusiastic director at its helm. All important boards and committees are in place and functioning acceptably. The partition of the grants between the nodes is appropriately established with regards to the infrastructure as a whole and not the individual members, and investments are discussed and awarded according to technical and scientific aspects. Cost models for different user groups (academic, industrial, etc.) are in place, appropriate and accepted. Operational and reporting needs are covered very well by the MyFab LIMS software system.

Accessibility

MyFab has three nodes at Chalmers, KTH, and Uppsala. Separated both geographically and by specialization, they are connected through a common access system, namely the MyFab LIMS software system. The software handles almost all aspects of access: application for use, scheduling tool time, fee charging, user statistics, etc. It is through this software that MyFab is truly a national infrastructure with wide accessibility across Sweden. Having multiple nodes is an ideal arrangement to provide a variety of expertise across a wider set of advanced capabilities; it also provides backup for more traditional fabrication capabilities in cases of extended downtime or emergencies. It is important for Sweden that a fundamental base set of lithography capabilities is available regardless of geography, and MyFab should continue to spread their resources strategically among the different nodes. The panel commends the infrastructure for growing a large, active user community across a very wide range of scientific disciplines both in academia and industry. The Research Council should look to MyFab as a model for other national infrastructures when it comes to user access.

The proposal process and fee tables are clear and fair, and access is almost entirely democratic. Proposals are rejected only in rare instances and only due to issues of feasibility. The panel recommends that MyFab makes sure the rationale for the rejection of a proposal is explicit and clear. Multiple access modes, including academic, industrial, process service and project-based ensure that the infrastructure maintains both the flexibility and consistency necessary for a facility of this type.

Continued growth is important for MyFab to remain at the forefront of European micro/nanofabrication facilities. The panel strongly encourages the planned "MyFab Access" program, which will allow one-time free access for potential new users. This is an excellent avenue for user base expansion, including non-traditional disciplines and researchers who might otherwise not have the opportunity or wherewithal to attempt access. The recent enlistment of a communications manager to help educate, advocate and advertise on behalf of MyFab and their state-of-the-art capabilities across Sweden is another excellent part of the outreach activities.

There is current discussion of expansion of MyFab to include the facility at Lund, which the panel strongly supports. The addition of Lund adds necessary additional capacity as well as strategic expansion in terms of geography and future science growth. With the large-scale infrastructures ESS and Max-IV coming on-line in Lund in the next several years, expansion there represents the perfect opportunity to couple nanofabrication to advanced analytical capabilities (and vice versa) with some of the most powerful instruments in the world.

Collaborations

As already mentioned, there are three nodes in MyFab that employ a unified software system for management. MyFab is introducing a quality system at all nodes, based on a successful ISO certification at KTH. The panel has the impression that MyFab is operated as a real national research infrastructure. Each site has its own focus area, and clients from industry are active users in all three sites. MyFab also hosts industry equipment for companies that do not wish to maintain their own cleanroom facilities; this is very useful in enabling a broad national collaboration between academia and industry. MyFab has substantial collaborations within Sweden. It was a founding member of SwedNanoTech, the umbrella organization for Swedish nanotechnology. MyFab has a particularly strong cooperation with Lund Nano Lab, which operates in a very similar fashion; it also employs the MyFab LIMS software for tool booking. Licensing of MyFab LIMS to other national research infrastructures has been part of MyFab's strategy, and is described further below. During the last several years, MyFab has become recognized abroad and has recently started to take an active and sometimes leading role within European infrastructure networks. MyFab contributes to Horizon2020 to strengthen bilateral collaborations with other national research infrastructures and to form new collaborations. The collaboration with Norwegian NorFab is well developed, with common meetings and a suggested sharing of the MyFab User Meeting in 2013. Collaborations with the French RENATEC and Spanish NANOLITO networks have been initiated and visits have been made to their sites. MyFab participates as the Swedish node in the "Small institutes group," together with partners from Finland, Norway, Ireland, Netherlands, Bel-

gium, UK, Greece and Spain. MyFab also follows the development in the EIN2 initiative for new calls. In addition, the MyFab nodes are members in the SiNANO institute and participate in the technology platforms of Photonics 21 and ENIAC, and are also members in a number of EU-funded infrastructure related projects, *e.g.*, FP7 Nano Connect Scandinavia and NANO-TEC (Chalmers), QNano (Uppsala University) and Technet nano (KTH).

Efficiency of usage

The panel explored the typical “user experience” at the facility. Many of the early interactions with users occur through the MyFab LIMS software system. Developed primarily as a laboratory equipment booking system, MyFab LIMS controls the total number of hours that can be booked for a particular project and how far in advance bookings can be made (typically within a week). It maintains all information on the tools/instruments along with logs of all usage, generates invoices, and tracks statistics. The system appears to have had significant impact, and was cited as one of MyFab’s “success stories.” It is used by national laboratory facilities in Ireland, Finland, Norway (which pay licensing fees), as well as at 10 other Swedish academic labs (no fee charged).

Projects at MyFab follow this general cycle of usage:

1. The user initiates contact with the closest node and asks staff if their activities are appropriate for the facility; alternatively, the user may learn this through the homepage or class/session
2. The user applies for access via MyFab LIMS
3. The user takes the basic cleanroom course (offered once or twice per month at each site); this includes basic safety procedures
4. The user creates a process plan (which must be approved in advance of booking instrument time)
5. The costs for carrying out the process plan are identified, and the user obtains authorization from the paying professor/supervisor
6. The user uses MyFab LIMS to book “driver’s license” training for the specific equipment needed, and takes that training with specialized staff
7. The user uses MyFab LIMS to book time on each instrument needed, then carries out the work

The large number of staff involved in MyFab offers the advantage that there is a wide range of expertise available to users (including approximately 20 PhDs). When an issue is beyond their knowledge, the staff members can redirect the question to other researchers and industry experts, in their extensive network. The availability of three labs provides some measure of reliability: if an instrument at one facility malfunctions, MyFab attempts to reschedule the work at another lab (and travel support funds are made available to the affected users).

The panel was informed that across the three MyFab laboratories, there were 622 users who actively used the infrastructure in 2011. This represents a growth rate of approximately 8% per year since MyFab LIMS tracking began in 2008. Some 80% of the users are academic; the remaining 20% are from industry; 80 companies were represented in 2011.

Although usage is tracked in detail, there is no coordinated effort to track results. The MyFab leadership said this is because they “don’t own the projects,” so anything beyond the processes at MyFab is a matter for the researcher and his/her university or company. They do send out surveys and solicit information for the MyFab annual report, however; last year they reported approximately 650 publications. A similar philosophy applies to open access; researchers are expected to do it, but the infrastructure takes no active steps since it does not actually store data or samples. The labs maintain “logbooks” for each instrument where users are encouraged to record their processing scheme parameters, suggested improvements, etc.

A user meeting across all MyFab labs is held every other year, rotating among the sites every two years. It generally lasts 1.5 days, and travel costs are subsidized by MyFab.

The role of the host university

Each of the 3 universities makes in-kind contributions to MyFab, consisting of staff salaries and facilities. At the outset, funds were divided according to actual usage of the labs. As it turned out, there were disagreements within MyFab on how to define “actual usage”, and too much energy was spent on trying to find a definition with little progress. At the end of MyFab first period of operation (2006), an agreement among the owner group representative to split the operations grant 30/30/40 was initiated to stabilize the situation. When Dr. Swahn took over as director, he convinced the owner group (one representative from each institution) and the Steering Group to continue the 30/30/40 agreement, in order to put all energy on organization development. When an increase in funding occurred last year, the director proposed that the Steering Committee determine how the increase could be used most strategically; thus, although each lab received a modest increase, most of the new funds went to project-wide needs.

The leadership representatives report that in general, relations with the universities are good and upper-level administrators are receptive to MyFab’s needs. For example, MyFab recently requested expertise in communications, and Chalmers agreed to allocate part of a university employee to assist in that capacity.

Conclusions

Overall, the panel recognizes MyFab as an example of successful investment in national research infrastructure. MyFab appears to be on the right path and should continue with present activities. The panel calls out the fact that the MyFab LIMS software, which has been described as the “biggest success” of the infrastructure, is a key component to making this a smoothly operating, fully national infrastructure. MyFab can serve as a model to other distributed infrastructures for micro/nanofabrication throughout Europe and as an example of a well-managed, national infrastructure for Sweden. A coherent strategy exists for maintaining the high quality of services offered to the existing user base as well as for expanding the user base throughout Sweden. The panel concludes that MyFab certainly fulfills the expectations of the grant, including the terms and conditions for research infrastructure. Collaborations between MyFab and Nordic and other international facilities are in place and they fulfill the expectations with respect to taking a national role in collaborations and outreach throughout Sweden and Europe. The panel also concludes that MyFab very actively makes Swedish nanoscience visible within the European Union and to potential users and investors. The panel has the understanding that most of the collaborations so far are on organizational and quality topics.

At the request of the Swedish Research Council, the panel inquired how MyFab would modify their plans if their budget were increased by 20%. The increase would be used to expand user support capabilities, update some of the equipment that has gotten to the end of its useful lifetime, add equipment to better support the life sciences community, and perhaps to reduce user fees somewhat. If instead the budget were cut by 20%, the short-term fix would probably be to increase fees. Longer-term, the MyFab leadership would need to seek sources from Europe, and if additional funding were not obtained they would have to reduce staff and phase out older machines – and user projects would need to be reduced accordingly.

The panel’s recommendations

Recommendations to MyFab

- MyFab and its management should continue to be strong advocates for nanotechnology in Sweden and fulfill its role as the focal point of the nation’s efforts in this area
- MyFab should foster official collaboration with the MAX IV Laboratory – many fabrication needs are associated with synchrotron work and these two infrastructures may be well suited to take advantage of each other
- Foster scientific collaborations with other facilities throughout Sweden and Europe. Expansion to Lund is an excellent opportunity and should be pursued to its fullest

- The proposed “MyFab Access” program is highly recommended and if successful should be extended and expanded as much as possible in the future
- MyFab should consider adopting a system for tracking publications, from another research infrastructure such as ILL or MAX-Lab. It is reasonable for the infrastructure to request some acknowledgement for work done in the facility
- The infrastructure should also consider an online system for tracking, storing and distributing process recipes, tips, etc. This information is the true “data” of the facility and should be preserved and made accessible to others
- When users are rejected due to feasibility or other reasons, the infrastructure must take steps to give its rationale for the decision, making it clear to the proposer why they were rejected and what they might be able to do to rectify any issues

2.3.3 PRACE

The Swedish Research Council has funded Sweden’s participation in the EU’s PRACE (Partnership for Advanced Computing in Europe) program, through a grant to SNIC valued at 75 MSEK for 2010-2012. This provides the primary support for high-performance computing (HPC) available to Swedish researchers. The panel notes that the documentation prepared by SNIC was extremely late (received just days before the review) not according to expected quality standards and thus very difficult to follow. The documentation was incomplete in the sense that it was not possible for the panel to determine how the funding income is mapped onto the expenses. The presentations did not clarify this, but provided only additional background material concerning the status of PRACE and the relation between SNIC and PRACE, without any serious attempt to clarify Sweden’s role or what Swedish funds were actually being used to accomplish.

As far as the panel could determine, the Swedish Research Council’s 75 MSEK investment has been used to:

- Pay the costs of PRACE membership (approximately 0.6 MSEK annually)
- Pay half the costs of Sweden’s participation in PRACE international projects (approximately 4.5 MSEK annually Swedish investments)
- A separate Research Council grant is used to fund national user support (5+7+9 MSEK for the 3 years)
- Pay 60% of the costs of procuring and operating a national-scale HPC computer as part of the PRACE system (approximately 110 MSEK total cost)

During the same period (2010-2012), the following support was received from the EU as part of the PRACE initiative:

- Pay half the costs of Sweden’s participation in PRACE international projects (4.5 MSEK annually)
- Pay the costs of specialized staff to assist researchers using the Swedish HPC computer (approximately 1.7-1.8 MSEK total; the precise amount was unclear)

Thus, almost every kronor invested by the Research Council was matched by EU funds. This arrangement is an indication of the high visibility and international importance of PRACE participation. Given the special relationship between SNIC and PRACE (the representatives explained it as “SNIC is part of PRACE, and PRACE is part of SNIC”), the panel was not able to perform a traditional review of the SNIC/PRACE project. The panel questions whether the right representatives were actually present for the review. The national SNIC/PRACE HPC computer is hosted at KTH. However, nobody from that university was included in the review, nor was any documentation pertaining to any of the partners supplied to the panel. The remainder of this document addresses the concerns of the panellists about the current state of the project.

Results and outcomes

The panel was not provided with any information about results or outcomes achieved through the SNIC/PRACE project, primarily because the first projects only recently finished their allocation periods. It became apparent during the meeting that there is an urgent need for SNIC to have a better overview of the scientific output that is result of using the SNIC/PRACE resources. Two Swedish projects were able to secure time on PRACE Tier0 computing, but no details about these projects were supplied. However, it is worth commenting on the research infrastructure's contribution to international cooperation in support of scientific progress.

There are two primary benefits of the SNIC/PRACE infrastructure project. First, by paying annual PRACE membership fees, Swedish users are entitled to access national- ("Tier1") and European- ("Tier0") level computing resources via PRACE's competitive application process. Second, by hosting one of the national-level HPC computers, Swedish users are entitled to 95% of the computing cycles on the SNIC/PRACE machine (located at KTH).

Management, organization and funding (apart from funding from the host university)

The panel notes that the supervision of the RI was recently transitioned from the Research Council to the University of Uppsala (February, 2012). The previous director left the project just prior to that transition and a new director was not appointed until June, so there appears to have been no significant overlap between directors. PRACE itself has a clearly-defined board structure, including a scientific steering committee that oversees the competitive application process, so the accessibility principles are well defined and are based on scientific merit for the Tier0 systems. PRACE also operates six training centres throughout Europe which organize open seminars, workshops, and training sessions for the benefit of all PRACE member countries. SNIC has its own board structure, including a scientific evaluation board called SNAC (Swedish National Allocation Committee). PRACE forwards applications for use of its portion (5%) of the SNIC/PRACE machine to SNIC. SNAC reviews those applications, along with applications for the Swedish portion (95%) of the machine, and decides how computer time will be allocated.

Staffing is clearly required to operate the SNIC/PRACE machine, but the representatives were unable to provide during the meeting any details about how many people are involved in those activities. According to the Terms & Conditions document supplied by the Research Council, \$3 MSEK annually are available to the project for "advanced user support." The panel believes that this refers to support required as part of the Tier1 hosting agreement with PRACE, reserved for Swedish users who receive allocations on the Tier0 machine, and for users from other countries who are given allocations on the SNIC/PRACE Tier1 machine.

As noted previously, a second grant from the Research Council to SNIC pays for additional specialists to provide user support to Swedish users on the national portion (95% awarded through a purely Swedish allocation process) of the SNIC/PRACE machine.

Overall, the panel was extremely concerned by the complexity of the structure for the SNIC/PRACE project. This is a major national investment in a critical infrastructure (HPC), and there is an urgent need to clarify roles, responsibilities, and expenditure patterns to avoid the creation of what the panel considers a high-risk situation.

Accessibility

The typical path for Swedish researchers to gain experience on HPC computers and position themselves for allocations on European systems is through SNIC (although any Swedish researcher is also free to apply directly through PRACE without previously working on SNIC systems). This path follows PRACE's pyramid-like structure, where users begin on local-level ("Tier2") computing facilities, in this case at Swedish universities. Many users will find this level sufficient for their needs, but those requiring more computational power move on to the SNIC/PRACE Tier1 machine at KTH, applying for a portion of the 95% reserved for national usage. If another type of computer architecture or software is needed, Swedish users may apply (through Sweden's PRACE membership) to use other Tier1 faci-

ties across Europe; if granted, access includes personalized support from specialists employed as part of PRACE's agreement with each Tier1 site. If Tier1 facilities prove inadequate, users have the option of moving up another level to the PRACE Tier0 systems. This time, in addition to the formal application process, users must first complete a "preparatory access" phase where they work with specialists to ensure that the needed software and protocols will work on the more powerful systems at the higher level. This poses a significant barrier to movement onto Tier0 systems, and PRACE has wisely required that Tier0 and Tier1 sites provide the necessary expertise to facilitate the process.

The major means of entry into HPC for Swedish researchers seems to be by self-discovery at the local level or via the SNIC website. There is no evidence of any structured outreach program. That is, a researcher decides on his or her own that HPC is needed and seeks out facilities at the local university. Because entry to the general SNIC system is done locally, it is not hampered by geography, although researchers at smaller universities may not find it straightforward to gain access. Once a researcher begins HPC use, they become part of the SNIC pool of users and potential candidates for accessing higher levels of computing within Sweden and in PRACE.

Identifying, developing and grooming candidates for the higher tier computing is essential to Sweden's research strategy. The panel feels strongly that SNIC must make a deliberate effort to support these activities – both in its SNIC/PRACE activities and through its nationally oriented activities. In particular, the panel strongly recommends that a structured outreach program be developed for identifying users, including those from non-traditional disciplines (*e.g.* social sciences and humanities), and assisting them to move into HPC. Relying solely on self-discovery and a website is insufficient to develop a large and active Swedish HPC community that can take advantage of PRACE's capabilities.

Collaborations

Altogether there are 24 countries represented in PRACE (referred to as "national nodes"), 18 of them hosting Tier1 facilities. The nodes serve as focal points for their countries' national HPC infrastructure and have similar objectives and responsibilities toward their national users.

The Swedish node in PRACE is led by SNIC, whose larger functions (beyond PRACE participation) are to coordinate six nodes throughout Sweden, promote the use of computation to solve complex scientific and engineering problems, and thereby enhance Swedish competitiveness, both for science and industry. SNIC represents Sweden Research Council in the PRACE Council. KTH in Stockholm operates the Swedish Tier-1 service funded as part of the SNIC/PRACE project. At the review session, the panel was told that staff members from individual SNIC centres have participated in PRACE activities, primarily based on individual competencies. It remained unclear exactly how the Research Council's and PRACE's funding for participation in PRACE international projects (4.5 MSEK annually from each source) is distributed.

The SNIC/PRACE representatives indicated that a new strategy is being developed for SNIC covering the period 2013-2016, and that the profile of the six different SNIC centres will be clearly defined. One hopes that their roles in SNIC/PRACE will also be clarified, since it is important that Sweden present itself coherently in the international HPC community and contributes actively to this work package of the PRACE activities. The panel concludes that, to date, there have been only limited efforts by SNIC/PRACE to advocate the PRACE resources in Sweden or to attract new users. In order to take full advantage of Sweden's investment in SNIC/PRACE, the management team needs to develop a proactive plan for raising awareness about national and international HPC resources in all Swedish research communities. It also needs to clarify – and publicize – the relationship between SNIC centres, the SNIC/PRACE team, and PRACE efforts.

Efficiency of usage

The usage cycle for the RI was described as follows:

- Users hear about the SNIC centre at their university (no targeted effort is made to attract them). If there is no local SNIC site, knowledge would be through the SNIC website

- The user applies through SNIC for an account on the local Tier2 machine
- At the next round of national allocations round, users automatically receive an email inviting them to apply for an allocation on the SNIC-wide system of Tier2 machines
- Once the user gains experience at the Tier2 level, assistance may be available from local centre to modify the application as needed to be appropriate for the SNIC/PRACE Tier1 machine
- Once the user is given an allocation on the Tier1 system, he/she receives emails about other PRACE facilities – and has access to application support staff who is dedicated to helping Swedish researchers take advantage of PRACE User support for the Tier1 system is provided through SNIC's online ticket-handling software (much like a normal computing centre).

The panel specifically asked the SNIC/PRACE representatives about the number of Swedish users on the SNIC/PRACE machines, since this information was missing in the self-evaluation (there was only a brief mention of Swedish projects on other PRACE facilities). They indicated that this information is tracked but could not give exact information during the meeting. The only numbers that could be cited were “27 projects, involving from 1-50 users each.” Since every commercial HPC machine includes user account tracking mechanisms, the panel finds it important that SNIC/PRACE is fully aware of their own usage patterns. The panel also asked how user results and user satisfaction with the SNIC/PRACE computer are tracked. Here, too, the answer was that there are no tracking mechanisms currently in place. PRACE users (i.e., those using the international 5% of the SNIC/PRACE machines and those using other Tier1 and Tier0 systems) are required to produce a final report that includes comments about each user's experience, and they are required to submit information about resulting publications. Thus, it appears clear that the disorganization and lack of follow-up stems from within SNIC/PRACE.

The role of the host university

The Swedish Research Council funding for SNIC/PRACE is routed through Uppsala University, but this arrangement is so recent that questions about the host university are not meaningful. The panel notes that it was the SNIC Board who chose the current SNIC Director. Presumably this means that the SNIC Board, not the university, is responsible for addressing problems with management.

Conclusions

Participation in PRACE has played an important role in building Sweden's HPC infrastructure, in terms of both capacity and capability. Given the growing importance of HPC to scientific and engineering competitiveness, the panel believes that it is critical for Sweden to continue its involvement in this key, and highly visible, international infrastructure. However, it would appear that the current PRACE management structure is complex to understand both with respect to PRACE and the SNIC centres, or even the needs of Swedish HPC users. Given the national importance of this program, the panel recommends that the SNIC Board conduct a detailed investigation to assess the quality of structure and leadership for this particular infrastructure and take corrective actions where necessary.

The panel's recommendations

- The Swedish Research Council should conduct a detailed investigation to assess the quality of structure and leadership for the SNIC/PRACE infrastructure project and take corrective actions where necessary
- Any review/summary needs to include a coherent description of the management structure for the project; this must include management of the SNIC/PRACE Tier1 machine carried out at KTH
- Any review/summary of the project also needs to identify what persons are paid from the Research Council's or from PRACE's funds, their levels of effort, and what their contributions are
- All websites for PRACE/SNIC have to be updated asap to reflect the current status.
- The project team should be able to provide yearly reports which include the number of applicants, number of users, demographics, usage patterns, etc. (The panel suggests that the SNIC/PRACE team follow the model provided by the MAX-lab project in their summary of usage.)

- The project team needs to track “testimonials” of how Swedish users benefitted from the SNIC/PRACE Tier1 machine. These stories should be highlighted on the website and included in the annual reports to help inspire future users
- The participation of people funded by SNIC/PRACE in PRACE’s international projects needs to be tracked as well. These efforts should be detailed on the website and included in the annual reports to demonstrate how Sweden contributes to the international effort
- Rather than waiting for users to discover that SNIC/PRACE and PRACE computing resources are available, the project team needs to proactively seek researchers using Tier2 facilities that have potential as HPC users, and work with them to move them onto the SNIC/PRACE Tier1 machine
- As stewards of the national investment in HPC, the project leaders need to mobilize an effective outreach campaign that can reach universities all over Sweden, educating researchers about the importance of HPC and how they can get involved
- In the same role, the project leaders must be stronger advocates for HPC in Swedish education, research, and industry
- As the national representatives to PRACE, the project leaders should be aware of, and able to describe coherently, all PRACE-related activities in Sweden, including usage of international PRACE resources by Swedish users.

2.3.4 SuperAdam

SuperAdam, located at Institute Laue-Langevain (ILL) in Grenoble, France, is Sweden’s first neutron reflectometer. The instrument is partly funded by the Research Council and is operated in collaboration with the Ruhr-Universität Bochum in Germany and became operational in 2010 (official opening ceremony June 2010). In this arrangement Swedish users have access to 30% of the beam time distributed throughout the year. The overall goal of the Super-Adam project is to strengthen the use of neutron scattering in Sweden. The SuperAdam reflectometer at ILL is the single most important tool to accomplish this within neutron reflectivity, which, in combination with educational efforts, training and outreaching activities forms the overall action scheme of the effort. The SuperAdam reflectometer at the ILL is currently operated in collaboration between Uppsala University, Sweden and Bochum University, Germany. The Swedish share is financed with 3.36-3.62 MSEK per year from the Research Council, about 1 MSEK from other sources plus funding from the host university of 1.26-2.52 MSEK per year.

Results and outcomes

As the first real neutron capability for Sweden, the SuperAdam infrastructure represents a brand new area of expertise and thus far scientific results and publications have been limited. Many of the achievements to this date have been technological in nature as the high resolution of the instrument has been demonstrated.

One area where the tool has been used is in the study of magnetic materials, resulting in a publication in Physical Review B. SuperAdam holds promise for a large range of scientific disciplines including condensed matter, soft matter and combinations of both. The real measure of success for SuperAdam will come in increased numbers of users from across Sweden and increased national awareness of how neutron scattering can play a part in Swedish scientific research. Their efforts in this area are described further below. Nonetheless new users are highly encouraged and welcome. Publications are tracked via the systems in place at ILL in parallel to the tracking done at the Swedish universities. Typically SuperAdam staff is part of the project after getting involved (at least 80% of the time) and thus have a good handle on what research is being done.

Management, organization and funding (apart from funding from the host university)

The panel met the director of SuperAdam Björgvin Hjörvarsson, staff member Max Wolff and post doc Maja Hellsing.

To assess the management and operation of the SuperAdam project we need to look at the different implementation steps.

The infrastructure was built until 2010 and has been in use since then. During the setup phase of the tool, it was primarily technical people who were involved and no real management structure was necessary or in place, other than the preliminary board. A final board still is not in place because the representative and final approval from the Research Council has still not been named. Regular meetings take place at least once per year. In 2010 the infrastructure became operational. The Swedish share is financed with 3360-3620 TSEK per year from SRC, between 750-1000 thousand SEK from other sources (plus funding from the host university of 1260-2520 thousand SEK per year). The ramp-up of users in Sweden has been somewhat slow. This is understandable, since SuperAdam deals with a completely new technical capability which has yet to be introduced to the research community. As of today (1st of October 2012), two persons are onsite at ILL in France to support the experiments. Two additional persons are dedicated at Uppsala to support the Swedish user community locally. One of them will be responsible in the future to promote SuperAdam to universities, especially in the north of Sweden. The other concentrates on technical consulting and implementation support for experiments. There are also two people – one at Lund and one at Linköping – who are focal points at their universities. They are also members of the preliminary steering committee. Currently there is no separate scientific committee, as this function is already established via the ILL-route. The Swedish community will use this path in the future to evaluate the quality of applications. Currently the scientific merit rules for Swedish applicants using the Swedish allotment are not that strict, because users are still in the learning and enabling phase.

The plan is also to take advantage of existing facility management resources at ILL, so that in Sweden will focus on technical and enabling services. For the downtime that will occur in 2013, a plan is in place for how to continue by relocating experiments to other sites.

Infrastructure operation is very lean and effective. The panel wants to point out, however, that the management resources current available in Germany will become unavailable soon. As Sweden will most probably take over the equipment and the corresponding German allotment (30%), there is a clear need for additional staffing resources. The panel strongly recommends that the SuperAdam implement an independent scientific advisory committee to help guide future strategy and operation.

Accessibility

One of the major challenges of the SuperAdam infrastructure is in developing a national community, not only of users of the beam line itself, but a community of neutron users in general. Admirably, Björgvin Hjörvarsson and the infrastructure's scientific staff recognize and embrace their role as ambassadors of neutron science in Sweden. In their estimation, SuperAdam is truly a national infrastructure because it is available to everyone in Sweden. The challenge is to make sure that potential users across the country and across disciplines are aware of this.

The growth of beam line users that extends beyond the Material Science department at Uppsala University was described by Prof. Hjörvarsson as “painfully slow.” Sweden is allotted 30% of the total time on “one of the most powerful neutron reflectometers in the world” which means that all potential users who would like access to the beam line are essentially allocated time during this ramp-up phase. There are two modes of access: via the standard ILL proposal process (with support from SuperAdam staff) or by straight allocation of some of Sweden's 30% allotment. This flexibility is important and ideal, because it means that projects do not necessarily have to compete with more developed neutron science for access. The panel sees this as a key component of building the community. Because the goal is not only good science but community development, the infrastructure puts a great emphasis on ease of access. If it turns out that SuperAdam is not the appropriate beam line, the staff will facilitate access to other beam lines either at ILL or elsewhere (*e.g.* NIST in Gaithersburg, USA, etc.) – the emphasis is on using neutron science in general. Travel to the ILL is not an impediment to using SuperAdam; if travel funds cannot be secured, assistance, often through ILL, is available. While there are efforts to expand the use of the beam line to soft matter experiments which have generated interest – including

the placement of a soft matter expert on their steering committee and the hiring of a postdoc with a background in polymers – a majority of the initial projects are in the material science area.

There is a strategy in place to continue the outreach and education efforts; including the hiring of a new postdoc, Maja Hellsing, whose main duty will be overseeing and expanding these outreach activities. The active “philosophy” of outreach includes workshops, visiting universities to give guest lectures, courses, training and summer schools, identifying local representatives at partner universities, and assisting with experimental planning, beam time applications and data analysis. The admitted target of these efforts is to develop the “next generation” of scientists, or even several generations away, so more unorthodox means of popular science education, such as an animated rock video, have been added to the strategy. In short, we feel the team is doing everything within their power to develop this community. Unfortunately, even the most enthusiastic advocate needs help. The infrastructure management team should look beyond their “inner circle” to recruit a scientific advisory committee which may be a source of independent thought and additional non-traditional advocacy.

For an infrastructure in its infancy whose primary goal is to educate and foster a growing community, the current modes of access are ideal. If and when the demand increases, we recommend that SuperAdam continue to leverage the ILL to handle its proposal evaluation process as well as other aspects of running the beam line. When Sweden takes over full control of the beam line in 2013, effectively doubling the amount of time allocated to Swedish usage, a decision will need to be made about the direction of the beam line to ensure that the available time best meets the needs of the Swedish research community at large. We recommend that the staff strongly consider pursuing the high flux beam line mode to ensure that the largest range of Swedish scientists can take advantage of the beam line.

Collaborations

The fact that Bochum University has proposed to hand over all their relevant instrumentation for SuperAdam to Sweden, proves that this cooperation has been very fruitful and that Bochum University trusts that SuperAdam will be successful in the coming years and continue to serve German researchers well.

The infrastructure has good connections with the associated Swedish universities. The steering group consists of active researchers from three Universities (Linköping, Lund and Uppsala). The basic idea is to obtain increased activity and visibility at as many Universities as possible. The members act as local contact persons at respective sites. The panel has the impression that this has been a successful approach and that more and more researchers at the institutions are becoming aware of the capabilities and what the neutron source can do for them. The result is that SuperAdam has had more and more users.

From a technical standpoint, the strong relationship with ILL is crucial. The cooperation is useful both from a technical standpoint and for users when they come to SuperAdam. Currently, the infrastructure has no technician based in Grenoble. This makes the relationship with the ILL technicians and technical services particularly important. The staff members are active researchers with many years of experience, who can guide researchers and projects to other installations, such as MAX -Lab in Lund and ESRF, as complementary research infrastructures.

An excursion to Grenoble as part of the master’s degree in physics is planned, where students will be able to get hands-on experience of a real instrument as part of their coursework. These opportunities will be offered to other Swedish universities running similar courses. Staff from SuperAdam has both given and participated in courses on neutron scattering and a course on that topic has been added to the Master’s degree program at Uppsala University. First held in 2010, the course has financial support from the faculty and most lectures have been given by external experts. The idea was to initiate contacts and collaborations with international partners, which turned out to be very successful. For the excursion the students visited the Helmholtz-Center Berlin and were able to do hands-on experiments. The course is planned to run at a two-year interval and will thus be given again in spring 2012. This year the course is financially supported by the graduate program in advanced materials, and the excursion will be to the ILL, with hands-on experiments using the SuperAdam instrument.

Efficiency of usage

The panel explored the typical “user experience” both prior to arriving and on-site at the facility. Early training (see previous section) helps users determine if the facility is right for their needs. The usage cycle at the facility follows this general pattern:

1. The potential user contacts one of the SuperAdam team members with a concept for the scientific problem to be addressed. Discussions back and forth (in person or remotely) determine if the problem is appropriate, with simulations run to facilitate the process. If the problem is not suited to SuperAdam, the user is assisted in finding other facilities that might be more appropriate.
2. The user submits an application to ILL’s competitive process. If successful, ILL assists with travel funding. If the proposal is not successful (usually because the user is new to this type of research), time is allocated from the Swedish allotment instead.
3. The SuperAdam team assists the user to characterize the sample to be used.
4. A specific time slot is scheduled for the experiment.
5. The user books rooms at the ILL facility and makes travel arrangements.
6. Prior to arriving on-site, the user goes through ILL’s online training materials and demonstrates his/her familiarity by passing the associated exam. This is required before anyone can use the facility. Users must also agree to follow the Vancouver conventions on open publishing as a condition of performing the experiment.
7. The user arrives on site and is assisted with the experiment by members of the SuperAdam team.
8. At the end of the visit, ILL requires that the user complete a user survey covering the on-site experience and general user satisfaction.

This research infrastructure is somewhat unusual in that major portions of the on-site support are outsourced to ILL as part of the contractual arrangements. Thus, ILL is responsible for the computing and networking infrastructure, sample environment, user office facilities, living quarters, etc. As indicated in the final step of the usage cycle, ILL constantly monitors the quality of the user experience, and apparently user satisfaction ratings are consistently high. The SuperAdam team provided the Swedish Research Council with a list of 49 individuals, each of whom was a direct user of the facility. The current user audience seems to be using the Swedish allotment fully, as well as at least some of the ILL portion.

The strategy for tracking user results is that one or more of the SuperAdam team becomes directly involved with each project; as colleagues, they are then informed about publications and presentations. ILL also attempts to track publications resulting from experiments. The fact that users agree in advance to follow the Vancouver conventions (#6 above) means that publications are open-access. At this time, access to data is still being handled internally, but the team says that when other groups request data, it is always made available to them.

The role of the host university

Uppsala University does not appear to interfere in any way with SuperAdam planning, budgeting, and operations. Their role is limited to administrative support and assistance with reporting requirements. The two other universities involved (Lund and Linköping) are even less involved, since no funding is distributed to them under the current contract. All three universities contribute to the project by supporting the time spent by the four principals. It appears that the upper administrators of Uppsala and Lund universities are only beginning to be aware of the importance of SuperAdam, and there is even less awareness at Linköping.

Conclusions

The infrastructure fulfills the expectations and conditions regarding collaborations in order to strengthen the use of neutron scattering in Sweden. The SuperAdam reflectometer at ILL is the single most important tool to accomplish this within neutron reflectivity, which in combination with educational efforts, training and outreaching activities forms the overall action scheme of the effort. The panel concludes that this has been very successful. The people responsible for SuperAdam have made

a substantial effort to involve other institutions in collaborations, and the cooperation with ILL and Bochum is especially excellent and highly beneficial for Swedish users.

At the request of the Swedish Research Council, the panel asked about the current level of funding, and the potential impact of increased/decreased levels. The SuperAdam team is indeed hoping for a significant (20-30%) increase in order to double the beam time available for Swedish users. Because of the special relationship with Bochum University, investing this additional amount will also result in Bochum's donating to SuperAdam a significant amount of equipment. These will effectively double the impact of the new investment.

If, on the other hand, the budget were to be decreased significantly (the panel posed a scenario of -20%), it would be impossible to recoup the funds from other sources. The management team was clear that they would have to close down the operation if this occurred, since a project of this type "simply doesn't work if you're under-financed."

The panel's recommendations

Recommendations to SuperAdam

- Form a board, or at least a scientific advisory committee, made up of people from a range of disciplines and institutions. These people will not be directly involved in management, but will fill an important dual role: providing external guidance and serving as advocates for the facility
- Continue to be enthusiastic advocates for neutron science. Recruiting or enlisting other potential advocates could help spread the word
- Arrange with ILL to receive summaries of the user survey for all SuperAdam users, to replace the separate Research Council user survey effort
- Continue to leverage ILL for matters concerning user management, proposals, etc. Expand use of ILL support as beam line usage grows
- During the 2013 upgrade, consider pursuing a high flux beam line mode to broaden appeal to larger population of Swedish scientists. It would be best if SuperAdam could secure a number of high flux slots in exchange for SuperAdam slots at ILL
- SuperAdam operation is very lean and effective. The panel points out, however, that the management resources currently available in Germany will become unavailable soon. As Sweden will most probably take over the equipment and the corresponding German allotment, there is a clear need for additional staffing resources

3. RECOMMENDATIONS FROM THE PANELS TO THE SWEDISH RESEARCH COUNCIL

After the hearings, a workshop was held with the Chairs of the three evaluation panels, discussing if there were any shared observations that could be forwarded as recommendations to the Swedish Research Council regarding the National Infrastructures. All Chairs agreed upon that management issues such as the roles and responsibilities of the Board, the Director and the host university as well as the quality of the Board, the Director and the Scientific Advisory Council/Committees of the national infrastructures need to be clarified in order for the infrastructures to reach the level of success that is desired. In the process of starting up infrastructures, it is crucial to start by defining what the infrastructures should do and to provide clear guidance on what is requested from them regarding for example efficient strategic and day-to-day management and prioritizations in their work. The Swedish Research Council must decide on and follow up a few key management principles for the national infrastructures since high quality management and leadership is essential for the success of the infrastructures. This includes

1. What kind of management structure is desired?
2. What are the leadership qualities desired?
3. What kinds of governing bodies are needed?
4. What are the roles, responsibilities and reporting relationships of the boards?
5. What is the minimum time requested that the directors devote to infrastructure duties?
6. What should the role of the nodes be in the infrastructure management?

3.1 Specific recommendations to the Swedish Research Council from each evaluation panel

In the following specific recommendations from each panel to the Swedish Research Council is given, including feedback on the evaluation process.

3.1.1 Specific recommendations from Panel A

- The Swedish Research Council should require the infrastructures to undertake, and maintain, a risk assessment that includes an account of mitigation measures. This should be reported in the strategic and operational plans. Detailed guidance should be provided by the Swedish Research Council to the infrastructures
- The Swedish Research Council should make sure that the terms and conditions for future agreements take into account the lessons learned from the Swedish Life Watch experience
- The Swedish Research Council should begin planning for a funding and management structure that will support ICOS Sweden uninterrupted for many decades to come
- Consideration should be given to including, in the terms of funding grants for environmental and climate research, a requirement for researchers to provide metadata to ECDS.

Recommendations regarding the evaluation process

- The evaluators found a large difference between the impressions formed of the infrastructures from the self-evaluation and from the hearing. The presentations at the hearings were comprehensive, educational and provided a broad professional encapsulation of the infrastructures that was not ob-

tained from the reading of the self-evaluation form. The self-evaluation form needs to be improved to allow the infrastructure to give a better account of its situation. For example, more detailed information on staff and management, board members and advisory board members could be requested. Interactions with the host university could be better described. The given questions and subjects in the self-evaluation seemed better suited for those infrastructures that were more established and running, than those that were still in a construction phase.

- The SWOT analyses need to be better structured with more detailed guidance provided by the Swedish Research Council to the infrastructures.

3.1.2 Specific recommendations from Panel B

Overall, Panel B was impressed by the successful establishment of several national-level RIs in the area of biological and medical sciences. However, the interviews also brought up several issues warranting further consideration at policy level and in terms of funding, and Panel B would like to direct the attention of the Swedish Research Council to the following issues:

- The Swedish Research Council needs to specify how it intends to measure and evaluate the performance of the infrastructures. Should they prioritize sample volumes or scientific excellence (in an international perspective) for example? How are the 'users' defined, prioritized and documented?
- At this early stage of development, the host university seem often to dominate the use of the infrastructures; The Swedish Research Council should define criteria for national use of the infrastructures and reward successful infrastructure for broad exploitation of the facilities and services. All participating universities, not just the host/s should prioritize their involvement in the RI in terms of co-funding and work in-kind.
- The Swedish Research Council need to be clear on how leadership qualities of the Director and the proposed governance structure are assessed in the process of selecting a national infrastructure.
- The Swedish Research Council should discourage significant overlaps between the RI's and instead encourage synergies and collaborations.

Recommendations regarding the evaluation process

In future evaluations, request that the following information be included explicitly:

- table of staff, showing name, physical location, primary role, and % of time
- table showing the members of the board, institution, and disciplinary area
- include University non-monetary contributions (support of faculty time, physical facilities, etc.) in the financial table
- life-cycle and approx. timeline for a "typical project"
- require that annual reports be provided as part of the basic documentation for all review panels

3.1.3 Specific recommendations from Panel C

- The Swedish Research Council should require that the research infrastructures regularly monitor usage and user satisfaction and give clear guidelines for how to report user statistics (for example, gender/nationality/discipline etc.).
- The Swedish Research Council should establish a website listing all the research infrastructures - and require that each infrastructure provide a website so you can link to it
- The Swedish Research Council needs to be more specific about what they want from the infrastructures. What are key developments and how should it be reported back to the Swedish Research Council?
- The Swedish Research Council needs to discuss whether all national research infrastructures should be instructed to prioritise projects and distribute resources in a clear and transparent manner based primarily on scientific quality. Most of the projects in service research infrastructures like MyFab have already been through a peer-review process when applying for their research grants.

APPENDIX 1. COMPREHENSIVE RESEARCH INFRASTRUCTURE CALL

Large-scale research infrastructures – Research Infrastructure

Final date for application is 2009-04-29

- 1 Type of grant
- 2 Who can apply?
- 3 Form of application
- 4 Appendices
- 5 Evaluation and decision
- 6 Contact
- 7 How and when to apply

1. Type of grant

The Swedish Research Council is announcing grants for comprehensive research infrastructures which are so far advanced in their planning that build-up or operation can commence before the end of 2010. The infrastructures will be of broad national or international interest and provide the conditions for world-leading research.

As regards distributed international research infrastructures, grants can be sought for the build-up and operation of the Swedish side of the infrastructure or for Swedish participation in a current international project. The announcement concerns only infrastructures included in the Research Council's Guide to Infrastructure.

Conditions for grants

- The grant will relate to infrastructures in accordance with KFI's criteria - see below.
- Projects suitable for a grant must be so far advanced in their organisational and technical planning that build-up or operation can commence before the end of 2010. A detailed, long-term budget should exist for on-going work and, where relevant, a technical design report or similar.
- Costs allowed: Wage costs can be included in the grant. The grant may not be used for doctoral wages and fellowships.
- Period of the grant: A grant can be awarded for a maximum period of five years at a time. Investment grants will be paid out during the depreciation period.
- One requirement is for the applicants to provide a supporting letter giving evidence of consultation with the vice-chancellors of affected higher education institutions.
- Only one application per infrastructure will be admitted, and the main applicant should act as coordinator for Swedish interested parties as regards the infrastructure in question.

Criteria for infrastructures:

- Being of broad national interest
- Being of promise for world-leading research
- Can be used by several research groups/users on highly qualified research projects
- Be so comprehensive that individual groups cannot run them independently

- Have a long-term plan for scientific aims, funding and utilisation
- Be openly and easily available to researchers and have a plan for how availability can be improved (applies both to use of the infrastructure, access to data collected and the representation of results)

2. Who can apply?

Representatives of infrastructures or researchers or groups can apply who are or who will be participating in the running of existing national and/or international infrastructure projects which are included in The Swedish

Research Council's Guide to Infrastructure (Report 11:2007, Table 1A). Exceptions are infrastructure organisations of which Sweden is already a member through the Research Council, or has an agreement or similar.

The main applicant should have Swedish doctor's degree or foreign qualification deemed to correspond to a Swedish doctor's degree. The date of the doctor's degree means the date the certificate is issued. The certificate must have been issued by the last application day. There is no age limit for applicants to the Research Council.

Employers and employment conditions

The project leader for grants funded by the Swedish Research Council must be employed by the host university/institution, unless the Swedish Research Council and the host university/institution agree otherwise. If the project leader has another employer, the latter must approve his or her commitments.

Administration

Grants are normally administered by a Swedish university/institution or another Swedish public organisation with research as its purpose.

A signature on the application (Appendix S) is required not only from the applicant but also from the authorised representative of the host university/institution (normally the head of the department or establishment where the research is to be conducted).

3. Form of application

A full application will consist of a completed web form together with annexes (see under heading Appendices). Note that a signed Appendix S should be sent in to the Research Council in hard copy form.

The instructions below apply to some of the headings occurring on the web form. When the form is being filled in, further information/help will be available on every point by clicking on the blue-highlighted text for the point in question.

Languages: Applications including annexes should be in English apart from the obligatory popular-science project description, which should be in Swedish.

Applicants and other participants

The person acting as applicant for a grant will be academically responsible for the infrastructure/similar. Other participants should include the leaders of the research groups who are intending, as well as the main applicant, to use the infrastructure and where relevant the researcher, technician or principal who will be responsible for operation and maintenance. Not more than four participants should be entered on the web form, and any others can be listed in Appendix A.

Proposals for evaluation panels

One of KFI's evaluation panels should be selected from the list of such.

Budget

Please provide a brief budget on the application form. A more detailed account of the infrastructure giving total cost calculations including grants from other financiers should be shown in Appendix ÖA.

For self-produced instruments or plant, other direct costs can be included, as well as for raw materials and components, such as consultancy costs, and a reasonable share of wage costs including social security contributions. Costs for these should be entered in detail in Appendix ÖA, point 2b.

The Research Council recommends contacting the purchasing office at the university or college before offers are invited.

Indirect costs (overheads, etc)

Do not include indirect costs (overheads) in the application budget. The Council will calculate such costs within the scope of the grant in accordance with agreements in force at universities and colleges or other authorities. An increment for indirect costs will be included in grants awarded in relevant cases.

VAT

Funds to be administered by state universities or colleges or other authority, municipality, court or company/organisation which are subject to VAT will be calculated in the application without VAT.

Otherwise the amount sought should be calculated inclusive of VAT.

Limitations

Grants must not be utilised for wages for doctoral candidates or fellowships.

Infrastructure organisations of which Sweden is already a member through the Research Council or has an agreement or similar cannot be awarded a grant.

Projects acceptable for a grant must be sufficiently mature so that build-up or operation can start before the end of 2010.

Only one application per infrastructure will be accepted.

Summary

A summary of the research programme on the web form should contain a description of:

- The infrastructure to which the application relates
- The research to be carried out with the support of the infrastructure
- What is to be done with the grant
- A description of the current status of the proposed infrastructure

The text is intended primarily for fast orientation as to the purpose of the proposed infrastructure and should be written so that also people with a differing research orientation than that of the applicant can read and understand the information.

Popular science description

The popular-science description on the web form should be in Swedish and written so that even those without a thorough grounding in the subject are able to understand what the project/similar is about.

If the application is granted, the Research Council reserves the right to use the popular science description for information purposes.

- Describe the use of the infrastructure and the new opportunities it will provide for the research.

General conditions for the application

Applications to the Swedish Research Council must be made entirely electronically, by means of an online form reached by the link "Ansök här/Apply here (VR-Direct)" on the Swedish Research Council's website.

Detailed technical instructions are provided with the online form. The online form requests automatically the appendices required for the type of grant selected. Applicants should then enclose the appendices, preferably as pdf files, or convert them into pdf files according to the instructions accompanying the form. It is the responsibility of the applicant that the application, converted to a pdf file by the application system, is complete and that all appendices are enclosed.

- Applications should be submitted electronically.
- Incomplete applications will not be processed.
- Divergences from the instructions will be considered in the assessments.
- Additions to applications after the last application date, excluding additions that are explicitly specified in the instructions, are not approved.
- If funding from another funding agency is granted for the same purpose as is applied for in this application, the project leader should report this to the Swedish Research Council as soon as possible.
- Materials not explicitly requested should not be enclosed and are not included in assessment of the application. An example of such material is a letter of recommendation.
- If a grant has already been approved for a project or equivalent for the years that the application refers to (as stated in the contract/decision issued by the Swedish Research Council for the grant concerned), no new application for this project or equivalent should be submitted.
- Only one application for a single project or equivalent and grant type may be submitted to the Swedish Research Council.
- The applicant must specify the primary scientific field and/or subject area of the proposed project. An applicant who considers that the project involves more than one field or area should state this in the beginning of the research programme. Within the Swedish Research Council, the decision is thereafter taken where primary responsibility for the review should lie and whether one or more other scientific councils or committees should make a supplementary assessment.

Consultation when building up new databases

One element in the Research Council's efforts to increase the availability and use of existing data is the setting up of the Swedish National Data Service (SND) at the University of Gothenburg. SND is a national strategic resource for research which has as its principle object the provision of information about data which are of interest to research within the humanities, medicine, social science and educational science, and making databases available to the research community.

Applicants are therefore encouraged to participate in these efforts by consulting and collaborating with SND on the setting up of new databases, and in connection with the maintenance, care and temporary shutdown of existing databases. See <http://www.snd.gu.se/> for further information.

Public access

Applications to the Research Council are public documents. If you are intending to apply for a patent, note that the Council cannot impose secrecy on applications for a research grant. An application containing materials also to be included in an intended patent application should therefore be submitted to the Council in the batch after the patent application is submitted.

Information on grants awarded will be published on the Swedish Research Council's website.

Ethical considerations

General

The Swedish Research Council supports only research that is of consistently high ethical quality. Ethical issues are particularly important in research that entails experiments on humans or animals. This applies especially to research on children or people with intellectual disabilities and to questionnaire surveys involving sensitive information, and research that includes processing of personal particulars. Note that ethical issues and problems arise in other types of research as well. It is therefore essential for researchers to have the opportunity, in their applications, to describe the ethical issues they believe are raised by their projects and give an account of on how these issues are to be dealt with in the research work. This is done under a special heading, 'Ethical considerations', in the application.

The documents that are primarily relevant to research ethics are:

- 1 The Swedish Research Council's publication *Good Research Practice - What Is It?* (Report Series 1:2005), available for download from the Research Council's website, <http://www.vr.se/download/18.6b2f98a910b3e260ae28000469/Good+Research+Practice+20+april.pdf>.
- 2 The Helsinki Declaration (the World Medical Association Declaration of Helsinki, *Ethical Principles for Medical Research Involving Human Subjects*, 1964, 2008), which in its essentials is also relevant to disciplines other than Medicine. It is available for download at <http://www.wma.net/e/policy/b3.htm>.
- 3 The Council of Europe's Convention for the Protection of Human Rights and Dignity of the Human Being with Regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine (1997). Available for download at <http://conventions.coe.int/Treaty/EN/Treaties/Html/I64.htm>.

Researchers should familiarise themselves with these documents and plan their research in such a way as to fulfil the requirements therein. The account of ethical considerations should show that, and clarify how, the requirements are met. (It is thus insufficient simply to write that, for example, the Helsinki Declaration or the Swedish Research Council's guidelines will be complied with.) If, in the applicant's estimation, there are no ethical problems connected with the project, although its subject-matter falls within a research field where ethical problems may arise, this view should be explained under 'Ethical considerations'. This is particularly important in research on humans.

The aforesaid documents are available in the Codex database (<http://www.codex.vr.se/>). This database also includes other relevant documents and a comprehensive collection of current legislation in the field of research ethics. The documents mentioned above should also, where applicable, be borne in mind for research in all academic disciplines.

When personal particulars are to be used in a project, the Swedish Personal Data Act (1998:204) must be complied with. See also SFS 2003:460, SFS 1949:105, SFS 1980:100. The applicant's account of ethical considerations must state that personal data as defined in the Swedish Personal Data Act will be dealt with. Queries regarding the processing of personal data may be addressed to the Swedish Data Inspection Board (tel. +46-8-657 6100, <http://www.datainspektionen.se/>). Regarding personal data, the Research Council's report on the handling of material that is sensitive in terms of personal integrity (*Hur bör integritetskänsligt material hanteras*, 2007) is also valuable. This report (in Swedish) can be downloaded from the Council's website (http://www.vr.se/download/18.aae1aa51132473084980005790/integritetskansligt_forskningsmateria21.pdf).

In the online application form, the applicant must specify the page in the research programme that contains the account of ethical considerations. If the Swedish Research Council regards the researcher's ethical considerations as unclear or incomplete, the Council may request that the researcher submit a supplementary statement on this point.

Research involving humans

Certain kinds of research concerning humans must always, under the Act on Ethical Review of Research Involving Humans (2003:460), be reviewed by a regional ethical review board. Detailed information about the Act and ethical review is provided on the ethical review boards' websites (see <http://www.epn.se/> for information and links to the regional boards).

If the researcher intends to subject his or her project to ethical review, this should be stated clearly in the description of the research programme. The Swedish Research Council may also, before approving a grant, request that the researcher subject the project to ethical review. Notification of a review board's approval, sent to the Council, is then a condition for disbursement of the grant.

The Swedish Research Council may also require ethical review of projects that are not regulated in the Act on Ethical Review of Research Involving Humans, or are beyond its scope of application, but may entail other ethical considerations. The regional ethical review board then itself rules on whether to carry out a review under the Act or whether to carry out what is known as an 'advisory' review. As stated above, notification of the decision or the advisory statement of opinion must be submitted in order for the grant to be disbursed. (Both approval and an advisory statement may contain conditions for implementation of the project.)

Review by a regional ethical review board takes place on application. The application form can be downloaded from <http://www.epn.se/>. If the project is beyond the scope of application of the Act, the applicants must use the form to request an advisory statement of opinion.

Research including animal experimentation

For research that includes animal experiments, approval must be obtained from an ethical committee on animal experiments. If no such approval has been given when the application is submitted it must be obtained as soon as possible, and in accordance with the Animal Protection Act, before experimentation is commenced. Notification of this approval need not be sent to the Swedish Research Council. A grant is provided on the assumption that approval has been granted before the research work begins. By approving the conditions of the grant decision, the project leader and the representative of the host higher education institution confirm that they take responsibility for this matter.

Commercial interests

One basic requirement in the Swedish Research Council's overall conditions for awarding research grants is that the knowledge generated by the research must be made publicly available in an objective manner. This requirement is supported by the general premises on which good research practice has long been based. The Swedish Research Council's interest is prompted partly by a wish to ensure that findings from research that the Swedish Research Council itself funds can always be published freely, but also by the fact that findings are disseminated among research groups and HEIs.

Responsibility for ensuring that researchers comply with the requirements of objectivity, independence and openness that are accepted in the research community rests primarily on the researchers themselves. Secondary responsibility rests on their employers, i.e. the individual HEI, concerned.

As stated in the Swedish Research Council's guidelines for reporting commercial ties, heads of department or equivalent who, on behalf of the employers, approve researchers' applications for Research Council grants must also guarantee that the researchers concerned have no known commercial ties that conflict with these requirements. However, it is the researcher's responsibility to supply the head of department or equivalent with a report in writing on all possible commercial ties that the applicant and/or participant(s) have for the entire project (not only the subproject concerned), so that the head of department or equivalent can examine and assess whether these ties are reconcilable with the requirements of objectivity, independence and openness that are accepted in the research community. Any ties that arise during the grant period must be reported, examined and assessed in a corresponding manner and, in the event of the requirements being contravened, must be immediately reported to the Research Council.

Gender research and research with a gender perspective

Applications concerning gender research or research with a gender perspective should be indicated by writing "gender" as one of the keywords in the application form. These applications will be evaluated by the Swedish Research Council's ordinary evaluation panels.

4. Appendices

Note that appendices must be in English.

The following appendices should be added to applications for comprehensive infrastructure:

- Appendix A: Research programmes of not more than fifteen A4 pages
- Appendix B: Applicants' CVs
- Appendix C: Publications list
- Appendix ÖA: Operating grants
- Appendix Ö: Special investment/purposes. A supporting letter from vice-chancellors and representatives of other participating organisations should be added under Appendix Ö.
- Appendix S: Signatures of the applicant and a representative of the host college or similar.

When so required, these annexes should also be appended to applications. This can be accomplished by clicking on the desired box on the application form, under APPENDICES:

- If an application has been preceded by a project planning grant from the Research Council, a report should be added to this effect (Appendix T).

The Times New Roman typeface, 12 points, is recommended. Illustrations and text should fit on an A4 page, with a margin of 25 mm. Printout of the application, e.g. by a reviewer, will be made in tones of grey with a resolution of 200 - 300 dpi. Figures should therefore conform to this standard. The appendices constitute the basis for the Swedish Research Council's evaluation of the application, and are filled in along with the online form. The online form requests automatically the appendices required for the type of grant selected. Some grant types also have optional appendices which must be marked with a check on the application form so that they can be attached to the application. On each page of the appendix, at the top, the applicant's name and Swedish personal identity number and the alphabetical code for the appendix should be written. All PDF files must be free of password security protection. Please observe that the reviewers will receive black and white paper copies of the applications, if they so wish. The reviewers also have access to the applications as pdf-documents.

Appendix A – Research programme

The application should consist of a brief description (12-point text, not more than fifteen A4 pages, including references) of the research infrastructure (infrastructure also includes Research Equipment and Large Databases) and related research giving the following information under separate headings:

- 1 Research aims: a description of the research aims for the infrastructure.
- 2 Overview of the area: a summary of the research being carried out or which can be carried out using the infrastructure. Key words should be given.
- 3 The infrastructure: a brief description of the infrastructure.
- 4 The importance: a brief account of the importance of the infrastructure in order to achieve these aims and their long-term significance for the research area.
- 5 Collaboration: a brief description of international and/or national collaboration with other infrastructures.
- 6 Participation, a brief description of how Swedish institutions of higher education are assisting in the buildfup or operation of the infrastructure.

Where relevant, an account or comments should be given under a separate heading:

- Ethical considerations
- Gender research and research with a gender perspective.

Appendix B – CV

A CV must be submitted both for the applicant and for the other researchers participating in the project (or equivalent). Note that the list of publications should be given separately, in Appendix C.

Specify in the order of the following numbered headings:

- 1 University degree (discipline/subject area).
- 2 Doctoral degree (year, discipline/subject area).
- 3 Relevant postdoctoral work (year and position).
- 4 Qualification as Associate Professor (year).
- 5 Current position, period of appointment, time for research in the position.
- 6 Previous positions and periods of appointment (state type of employment).
- 7 Parental leave, service in the Armed Forces etc, and research time deducted for this purpose.
- 8 People awarded doctorates for whom the applicant has been the main supervisor (name, year of doctorate).

Additional information of relevance to the application should follow.

The CVs may be up to a maximum of two A4 pages long per person.

Appendix C – Publications list

For the applicants and where relevant for the infrastructure to which the application relates.

Publications should be sorted under the following numbered headings in this order:

- 1 Referee-assessed articles
- 2 Referee-assessed conference papers
- 3 Overview articles, chapters in books, books
- 4 Patents
- 5 Self-developed, generally available computer programs
- 6 Popular-science articles/presentations.

On the lists, the researchers ten most important publications should be marked with a single asterisk (*) and the ten most important publications for the project/similar with two asterisks (**), stating brief reasons why these in particular have been chosen.

Appendix Ö Special projects/purposes

Supporting letter from vice-chancellors and representatives of any other participating organisations should be added Appendix Ö.

Appendix ÖA – Operating grants, KFI

1. Overarching

- A description of how the planned infrastructure fulfils KFI's criteria (See 1. About the grants). z A description of the infrastructure which is sufficiently detailed to permit an assessment of how well the aims expressed in Appendix A The Research Programme can be achieved.

- Useful scientific life, i.e. how long the infrastructure can be considered to be competitive.
- Similar infrastructure, national or international, and the possibilities to utilise them.

2a Budget

- Detailed budget (incl. LKP [wage costs supplement] but excl. VAT and OH) divided into wage- and other costs for:
 - Operation and maintenance
 - Premises costs
 - User support
 - Administration
 - Equipment (to be entered in detail under 2b) z Other national or international financiers who it is planned will contribute to the infrastructure, the distribution between them, the Swedish share, and the Research Council's putative share.
- Phase-out plan, including phase-out costs, transfer of staff and storage of data and documents.

2b. Budget for any equipment

- Detailed budget (incl. LKP [wage costs supplement] but excluding VAT and OH) divided into:
 - Purchasing of equipment and components
 - Any costs for own work relating to design of equipment
 - Any consultancy costs relating to design of equipment
 - Other costs relating to design of equipment.

3. Organisation/allocation of responsibility

- Allocation of responsibility for the infrastructure between different stakeholders: the host organisation and other national/international organisations. z The availability of the infrastructure to other researchers, incl. user support and any priority systems for use of the infrastructure.
- Timescale and assignment of responsibility for assessment, purchasing/building, installation and payment for equipment. The plan should be based on the fact that a decision concerning a grant will be given towards the end of the current year and that procurement will be in accordance with the law on public procurement. The details will be used as the basis for the Research Council's payment of any grant.

4. Other aspects

- Future upgrade possibilities in order to extend the useful academic working life of the infrastructure.
- Planning and funding of the expansion of competence in order to ensure optimal use of the infrastructure.
- Brief description of the need for equipment (existing or planned) relevant to the infrastructure

Appendix S – Signatures

Appendix S is enclosed automatically with the electronic application.

The appendix should be printed out and signed both by the applicant and by the head (or equivalent) of the department or establishment where the research will be conducted. The signature confirms that the department can accommodate the proposed research, position or equipment, that the costing in the application is approved for the department's part, and that any proposed experimentation on human or animal subjects has been reported, and that the applicant has reported any secondary occupations and commercial ties s(he) may have, and nothing inconsistent with good research practice has thereby emerged. The applicant must have discussed these conditions with the representative of the host university/institution before the latter approves and signs the application.

Appendix S is sent by regular mail to the Swedish Research Council.

Note! Appendix S, complete with signatures, must be received by the Swedish Research Council not later than three working days after the last application date.

Where relevant: Annex T – Project research grant

If an application has been preceded by an application for a project research grant from the Research Council, a report should be added (Appendix T). This should contain the most important conclusions from the project, the researchers/groups who participated, and the relevance of the project to the infrastructure in the current application.

5. Evaluation and decision

Assessment

The Research Council's announcements concern researcher-initiated, high-quality research. The scientific assessment of applications is carried out by active researchers. Each application is assessed in competition with other applications based on the Council's assessment criteria.

Assessment criteria

The Council supports basic research within all academic disciplines, and promotes quality and renewal in Swedish basic research. The Committee for Research Infrastructures has a further mandate to support infrastructures also for needs-tested/applied research which are in receipt of project grants or similar from other State organisations which fund research.

Quality of research is the basic criterion for the Council's allocation of grants and research. Allocation of grants is also intended to promote equality and flexibility within research.

Applications for infrastructure should also fulfil the Research Council's criteria for infrastructure either wholly or in part:

- Be of broad national interest
- Be of promise for world-leading research
- Can be used by several research groups/users on highly qualified research projects
- Be so comprehensive that individual groups cannot run them independently
- Have a long-term plan for academic aims, funding and utilisation
- Be open and easily available to researchers and have a plan for how availability can be improved (applies both to use of the infrastructure, access to data collected and the representation of results).

It should be possible to begin building up or commissioning the research infrastructure during 2010.

Representatives of applications partly or wholly fulfilling the criteria for "comprehensive infrastructure" will be called to a hearing at the Research Council to meet representatives from KFI's evaluation panels. Applications accepted after this hearing will then be assessed by an expert panel which will scrutinise the proposals from an international perspective (criteria used at the hearing and by the international panel).

Handling conflicts of interest

The Research Council has set up strict internal guidelines concerning conflicts of interest, which can be found in *The Swedish Research Council's Conflict of interest policy*.

Any conflicts of interest must always be reported by members of evaluation panels. Such reports are entered in the minutes of the panels' meetings and any such affected person has to leave the premises when the matter is being dealt with. If a member of any of the evaluation panels has himself submitted an application for a grant, this will be treated by another evaluation group than the one where the member himself is active.

Decisions

Decisions as to the funding of grants will be taken mid-September 2009.

Information about grants awarded will be published on *the Swedish Research Council's website* within a week following decisions.

6. Contact

Questions concerning the content of applications should first be sent by e-mail (firstname.surname@vr.se) or by telephone to: *Tove Andersson* +46 (0)8-546 44 262 *David Edvardsson* +46 (0)8-546 44 341 *Magnus Friberg* +46 (0)8-546 44 122 *Camilla Jakobsson* +46 (0)8-546 44 336 *Per Karlsson* +46 (0)8-546 44 177

7. How and when to apply

Applications should have been received by 12 midnight on the last application day.

Applications to the Research Council for grants for comprehensive infrastructure should reach the Research Council by Wednesday the 29 April 2009.

It is the applicant's responsibility to supply a full application. The Council's support line will be open until 16:00 on the last application day. Be sure to send in your application in good time before 16:00 on the last application day in order to obtain assistance if problems arise.

Signed copies of Appendix S should arrive by 16:00 on Tuesday the 5 May 2009.

Appendix S should be sent to:

Vetenskapsrådet
KFI
103 78 Stockholm

The dispatch should be clearly marked "KFI".

Link to the web form

The web form can be found on the Research Council's application system VR-Direct.

APPENDIX 2. ECDS CALL

Datum: 2008-05-12
Diarienummer: 811-2008-1292
Handläggare: Magnus Friberg

Värdskap för Svensk Nationell Datatjänst för Klimat- och Miljödata (SND-KM)

Vetenskapsrådet inbjuder svenska universitet, högskolor och eller motsvarande att anmäla intresse för att vara värmyndighet för *Svensk nationell datatjänst för klimat- och miljödata* (SND-KM) och därigenom tillsammans med Vetenskapsrådet forma en strategisk resurs för svensk forskning på lång sikt.

Bakgrund

Vetenskapsrådet har beslutat att göra en satsning på att tillgängliggöra data för klimat och miljöforskning. För det har Kommittén för forskningens infrastrukturer (KFI) låtit utvidga mandatet för *Database Infra-Structure Committee* (DISC) till att omfatta data för klimat- och miljödata. Satsningen innehåller också en utlysning av bidrag för att tillgängliggöra existerande forskningsdata samt inrättande av ett nationellt datacenter för klimat- och miljödata, SND-KM.

Beslutet att inrätta SND-KM grundas på utredningen '*Data för Svensk Klimat- och Miljöforskning*' utförd under 2007 av Docent Lars Eklundh, Lunds Universitet. Utredningen finns tillgänglig på Vetenskapsrådets hemsida: <http://www.vr.se/huvudmeny/pressochnyheter/nyhetsarkiv/nyheter2008/dataproblemhotarsvenskklimatochmiljoforskning>

I Eklundhs utredning framgår det att svenska forskare efterlyser en kvalitetssäkrad hantering av klimat- och miljödata insamlade för forskningsändamål samt en ökad tillgång till de miljöövervakande myndigheternas data.

Beskrivning av SND-KM

SND-KM är en nationell angelägenhet med stöd från Vetenskapsrådet. SND-KM bör vara samlat i gemensamma lokaler och ska ha ett vetenskapligt råd. Den myndighet som blir värd ska medfinansiera verksamheten.

SND-KM:s uppdrag ska omfatta:

- kvalitetssäkring samt dokumentation av existerande forsknings- och miljöövervakningsdatabaser
- insatser för att dessa ska hållas lättåtkomliga för forskning
- en koordineringsfunktion för forsknings- och miljöövervakningsdata som är arkiverade på skilda institutioner, vilket inkluderar t.ex. myndigheter och internationella dataarkiv
- forskar- och myndighetsservice med rådgivning och information om befintliga data samt övrigt stöd för forskare och myndigheter vad gäller datatillgång samt organisering och användning av stora datamängder
- aktivt samarbete och medverkan i nationella och internationella nätverk för dataarkiv
- samarbete med olika aktörer kring andra frågor som rör utveckling och uppbyggnad av databaser och t.ex. att säkerställa stödjande "mjukvara"
- att vid särskilda behov själv arkivera klimat- och miljödata som är av intresse för svenska forskare men som inte har en ansvarig myndighet.

SND-KM ska inom fem år ha genomgripande information om svenska databaser inom klimat och miljö samt överblick över motsvarande databaser i andra länder. Genom att bidra med snabb, billig och säker tillgång till data i Sverige och utomlands förväntas SND-KM kunna ge strategiskt betydande bidrag vid forskning inom sagda ämnen.

SND-KM ska inte överta universitetets och myndigheters skyldighet att arkivera data men bör vara behjälplig i att tillgängliggöra data. SND-KM kan mot full kostnadstäckning erbjuda sig att vara värd för andra intressenters data.

SND-KM och värmyndigheten

Organisationen bör ha en forskningsnära inplacering vid ett universitet, högskola eller motsvarande. Värmyndigheten ska ha arbetsgivaransvar för SND-KM:s anställda. Personal för dokumentation och hantering av data av olika slag måste antingen finnas att tillgå eller rekryteras. Bemanningsbehovet avser personer med tekniska kvalifikationer som är relevanta för etablering av tjänster inom detta vetenskapliga arbetsfält samt medarbetare med kunskaper om databaser och om dataservice och med förståelse och insikt om forskningsprocessen. Frågor om datasäkerhet ska hanteras både ur teknisk och juridisk synvinkel.

En nyckelfunktion är att bistå forskare och myndigheter med service och support, vad gäller information om existerande databaser och praktisk hantering. Organisationens hemsida är därför central. Arbetsuppgifterna förväntas innefatta utvecklingsarbete och samarbete både nationellt och internationellt.

Vetenskapsrådets stöd

Stödets varaktighet: Överenskommelse med värmyndigheten gäller för en period om fem år och kan efter utvärdering förlängas med ytterligare perioder om fem år.

Stödets omfattning: Vetenskapsrådet har avsatt 2 Mkr för 2008. Stödet till SND-KM från och med 2009 fastställs i en överenskommelse mellan Vetenskapsrådet och värmyndigheten. Värmyndigheten förväntas samarbeta genom att ställa resurser som personal, utrustning och lokaler samt medel till förfogande.

Föreståndare: Ett uppdrag som föreståndare om 50 procent av full tjänst ska utannonseras och tillsättas gemensamt av värmyndigheten och Vetenskapsrådet. Föreståndaren ska leda en organisation vars verksamhet är stadd i snabb teknisk förändring, vilket kräver receptivitet och visionär utblick. Dokumenterad erfarenhet och visad förmåga till ledarskap och samarbete förutsätts. Dessutom krävs egen erfarenhet av aktiv forskning och god inblick i frågor som rör forskningsdatabaser. Etablerade internationella kontakter, liksom breda kontaktytor inom svensk forskning är en merit. Föreståndarens mandat ska vara tidsbegränsat.

Vetenskapligt råd: Till SND-KM ska ett vetenskapligt råd knytas med företrädare för relevant forskning och personer med stor erfarenhet av administration av stora databaser. .

För detta stöd gäller Vetenskapsrådets generella villkor för bidrag i tillämpliga delar, liksom Vetenskapsrådets riktlinjer och rekommendationer för etik i forskningen.

Vem kan anmäla intresse?

Endast rektor eller motsvarande kan inge intresseanmälan. Anmälan ska avse verksamhet inrymd i för ändamålet avsatta och sammanhängande lokaler.

Anmälan utformning

Intresseanmälan ska vara på engelska och maximalt omfatta 10 sidor. Den ska redovisa en beredskap att ingå en överenskommelse med Vetenskapsrådet om arbetsgivaransvar och medfinansiering för att långsiktigt ställa resurser till förfogande för att utveckla SND-KM som en strategisk infrastruktur för svensk forskning. Anmälan ska därför redovisa värmyndighetens strategiska, institutionella och organisatoriska förutsättningar för åtagandet och omfatta följande:

- en beskrivning av den tänkta lokala organisatoriska strukturen, vilket inbegriper värmyndighetens koppling till, samt ekonomiska och personella stöd för SND-KM
- en redogörelse för hur värmyndigheten ämnar bidra till den lokala infrastrukturen (lokaler, bidrag till drift mm) för SND-KM.
- en redogörelse för forsknings- och verksamhetsinriktningar, specialistfunktioner och övriga processer vid värmyndigheten som stödjer uppdraget
- en beskrivning av hur värmyndigheten tänker sig att bidra till att uppfylla uppdraget: att göra databaser av intresse för klimat- och miljöforskning nationellt tillgängliga för att på så sätt öka svensk forsknings möjlighet att hävda sig i den internationella konkurrensen
- en ekonomisk plan för femårsperioden, vari värmyndighetens utgifter för indirekta kostnader kan medräknas som medfinansiering. För vart och ett av de fem åren redovisas intäkter: Löpande bidrag från Vetenskapsrådet, värmyndighetens bidrag och eventuella övriga medfinansiärers bidrag. En uppskattning av kostnader ska omfatta all personal samt utrustning och kostnader för forskarservice och övrig verksamhet, samt kostnader för administration och forskningskommunikation
- en kortfattad kommunikationsstrategi som beskriver målgrupper och metoder för att följa och kommunicera om utvecklingen inom området samt metoder för att öka kännedomen om existerande databasers egenskaper och användbarhet

Indirekta kostnader (overhead m.m.)

Värmyndighetens utgifter för indirekta kostnader kan medräknas som medfinansiering.

Offentlighet

Intresseanmälan till Vetenskapsrådet är allmän handling och därmed offentlig. Information om värmyndighet samt överenskommelse om SND-KM kommer att tillkännages på Vetenskapsrådets hemsida.

Bedömning och beslut

Redovisningen av värmyndighetens strategiska och institutionella förutsättningar för åtagandet ska bedömas på basis av engagemang från de intresserade värmyndigheternas sida och det resurstöd som ställs till förfogande för SND-KM. Samtliga inkomna intresseanmälningar kommer att bedömas utifrån följande kriterier:

- Potential för att bidra till en dynamisk utveckling av SND-KM till en strategisk och nationell resurs för svensk forskning.
- Organisatoriska resurser och förutsättningar för att uppfylla SND-KM:s uppdrag.
- Ekonomiskt och/eller annat stöd för SND-KM:s verksamhet.

Beredning

Intresseanmälningarna kommer att bedömas av en internationell expertgrupp med uppgift att värdera förutsättningarna hos värmyndigheten och resurser i den lokala miljön för att efter det utforma förslag till beslut. Eventuellt kan platsbesök förekomma. Verksamheten beräknas ta sin början under år 2009.

Beslut

Beslut om placering fattas vid KFI:s möte 2008-10-28.

Uppföljning och utvärdering

Uppföljning och utvärdering kan ske med internationell expertis och beslutas av KFI.

Kontakt

För ytterliggare information kontakta Magnus Friberg, forskningssekreterare vid Vetenskapsrådet, tfn: 08-546 44 122, mf@vr.se

När och hur intresseanmälan ska skickas in?

Intresseanmälan, märkt SND-KM (Dnr: 811-2008-1292), om maximalt 10 sidor och avfattad på engelska, ska vara Vetenskapsrådet tillhanda senast 2008-08-31 och skickas med post till: Vetenskapsrådet SE-103 78 Stockholm samt med e-post till: registrator@vr.se

APPENDIX 3. MYFAB AGREEMENT



Vetenskapsrådet

Datum
2010-06-07

Diarienummer
829-2009-6248

Bidrag till drift och utveckling av den svenska nationella infrastrukturen – Myfab

Bakgrund

Chalmers tekniska högskola AB (Chalmers) ska i nära samverkan med sina samarbetsparter Kungliga tekniska högskolan (KTH) och Uppsala universitet (UU) tillsammans med VR forma en strategisk resurs i form av en distribuerad nationell forskningsinfrastruktur (Myfab) syftande till att långsiktigt ge akademi, forskningsinstitut och företag tillgång till avancerade renrumsbaserade tillverknings och karakteriseringsmetoder av vikt för utvecklingen av mikro- och nanoteknik.

Chalmers ska under den överenskomna perioden driva och utveckla Myfab som en brett inriktad nationell forskningsinfrastruktur. Vetenskapsrådet åtar sig att för den angivna tidsperioden finansiera Myfab inom de ramar som anges nedan. Vetenskapsrådet har intentionen att långsiktigt stödja drift och utveckling av Myfab för att det ska fungera som en framgångsrik nationell forskningsinfrastruktur.

För att uppnå det övergripande målet och syftet med verksamheten är parterna överens om att

- avtalet omfattar renrumsbaserad mikro- och nanofabrikationsutrustning, relaterad karakteriseringsutrustning hos parterna samt personalstöd till användarna
- användare av infrastrukturen i rimlig utsträckning erbjuds det stöd som användaren behöver
- Myfab ska utformas i god kontakt med forskarsamhället
- Myfab ska bedriva aktiv marknadsföring med målet att attrahera fler och nya användare till den nationella infrastrukturen
- Myfab utgör ett kompetens- och kunskapscentrum för renrumsbaserade mikro- och nanoteknologiska metoder med aktiv verksamhet riktad mot universitet, högskolor, forskningsinstitut och företag
- Myfab ska verka för att och utvärdera möjligheterna för tredje man med relevant forskningsinfrastruktur att anslutas till samarbetet Myfab
- Myfab tillsammans med svenska lärosäten och andra forskningsinstitutioner ska medverka i nationella och internationella utvecklingsprojekt inom renrumsbaserade tillverknings- och karakteriseringsmetoder för mikro- och nanoteknik.

Som utgångspunkt för drift och utveckling av Myfab ligger Vetenskapsrådets utlysningstext för bidrag till omfattande infrastrukturer 2009 (VR dnr 811-2009-450), ansökan från Chalmers/Myfab (VR dnr 829-

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Vetenskapsrådet

2009-6248) och PM om nationell forskningsinfrastruktur (VR dnr 811-2010-148).

Beslut

Vetenskapsrådet beviljar bidrag till Chalmers för att driva och utveckla Myfab till en nationell forskningsinfrastruktur vars verksamhet syftar till att tillhandahålla expertis kring avancerade renrumsbaserade tillverknings och karakteriseringsmetoder av vikt för utvecklingen av mikro- och nanoteknik, för svenska forskargrupper. Målet är att stärka forskning och utvecklingen av mikro- och nanoteknik för att svensk forskning inom området ska kunna vara världsledande.

Chalmers ska administrera och fördela Vetenskapsrådets bidrag mellan ingående samverkansparter enligt samverkansavtal. Chalmers respektive övriga noders universitet ska ha arbetsgivaransvar för respektive samverkansparts anställda, tillhandahålla administrativ service samt ställa lokaler till förfogande och bidra till driftskostnader.

Vetenskapsrådet lämnar för åren 2010-2014 bidrag avseende Myfab med 149 miljoner kronor fördelat enligt nedanstående tabell. Summorna för 2013 och 2014 är preliminära. Efter utvärdering under tredje året kommer bidraget för nästa period att beslutas. Chalmers tillsammans med KTH och UU ska bidra med resurser under åren 2010-2014 motsvarande minst 250 miljoner kronor fördelat enligt nedanstående tabell, med preliminära belopp för 2013 och 2014. Fördelningen mellan de olika parternas bidrag specificeras i samverkansavtal.

	2010 (tkr)	2011 (tkr)	2012 (tkr)	2013 (tkr)	2014 (tkr)
VR	26000	30000	31000	31000 ^{*)}	31000 ^{*)}
Chalmers, KTH, UU	50000	50000	50000	50000 ^{*)}	50000 ^{*)}

* preliminärt belopp

Vetenskapsrådets bidrag kan komma att förändras under perioden om förutsättningarna för verksamhetens genomförande ändras avsevärt eller om Vetenskapsrådets anslag väsentligen minskar och driftsbidraget därmed måste inskränkas.

Karin Markides
Rektor och VD, Chalmers tekniska högskola AB

Lars Börjesson
Huvudsekreterare, Rådet för forskningens infrastrukturer



Vetenskapsrådet

Villkor för bidrag

Nationell forskningsinfrastruktur

Myfab ska vara en resurs för forskare från universitet och högskolor över hela landet. Myfab skall också vara en resurs för institut och företag.

Öppen tillgänglighet

Myfab ska ge akademiska forskare öppen tillgång till och kvalificerad service för att använda infrastrukturen oavsett akademisk institution. Akademisk forskning ska prioriteras framför kommersiell verksamhet.

Prioritering av projekt och fördelning av resurser ska göras på ett tydligt och transparent sätt baserat i första hand på vetenskapligt kvalitet. Riktlinjer för prioritering ska finnas i den strategiska planen för Myfab.

Datahantering

Forskningsresultat som som framtagits av akademiska användare av den nationella infrastrukturen Myfab ska normalt publiceras i enlighet med Vetenskapsrådets regler om "open access". Hinder mot publicering föreligger bl a om publicering skulle utgöra hinder vid immaterialrättsligt skydd av resultaten. Vid nyhetshinder kan publicering fördröjas under maximalt fyra månader från begäran, efter beslut av styrelsen. Kommersiella användare som betalar den fulla kostnaden för nyttjande av infrastrukturen har rätt att välja om och hur resultaten ska publiceras.

Kvalificerat användarstöd

Myfab ska tillhandahålla kvalificerat användarstöd, både rådgivande och operativt. Stödet ska vara utformat så att användare över hela landet som behöver utnyttja infrastrukturen ska kunna bedriva vetenskaplig forskning av hög kvalitet utan att själva behöva vara experter på den specifika instrumenteringen och metoden.

Utbildning

Myfab ska ge utbildning relaterad till användningen av infrastrukturen. Myfab ska också samverka med relevanta forskarskolor och andra utbildningsinsatser.

Kommunikation

Myfab ska löpande informera potentiella användare om infrastrukturens möjligheter.

Nya möjligheter och viktigare forskningsresultat som erhållits med hjälp av infrastrukturen ska aktivt kommuniceras till forskarsamhället, berörda myndigheter och till den intresserade allmänheten.

Internationell verksamhet

Myfab ska delta i internationella samarbeten och vara en konkurrenskraftig och attraktiv svensk nod för internationellt forskningssamarbete inom

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Vetenskapsrådet

avancerade renrumsbaserade tillverknings och karakteriseringsmetoder av vikt för utvecklingen av mikro- och nanoteknik. Lärosäten och personer inom Myfab ska också, på uppdrag av Vetenskapsrådet, kunna representera Sverige i internationella samarbeten inom området.

Särskilda begränsningar

Forskningsprojekt som utnyttjar resurserna vid infrastrukturen ska inte ingå i Myfab verksamhet. De resurser och tillgångar inklusive utrustning som ingår i Myfab specificeras i samarbetsavtalet mellan de samarbetande universiteterna.

Organisation

Placering vid värduniversitetet

Myfab ska drivas som en tydligt avgränsad verksamhet vid Chalmers. Den operativa verksamheten ska bedrivas vid de deltagande universiteterna på uppdrag av styrgruppen.

Styrgrupp

Infrastrukturen ska ledas av en styrgrupp som ska agera självständigt relativt den operativa ledningen. Styrgruppen ska ansvara för övergripande strategiska frågor och ekonomisk uppföljning. Vidare ska styrgruppen årligen fastställa budget och verksamhetsplan, ansvara för återrapportering och vara talesperson för Myfab externt. Styrgruppen ska rapportera till Chalmers ledning och ge Vetenskapsrådet fortlöpande information om verksamheten.

Chalmers ska i samråd med Vetenskapsrådet utse styrgruppen och en ordförande. Styrgruppen ska ha en bred sammansättning med kompetens som väl täcker såväl ledning av forskningsinfrastruktur som kvalificerad forskning samt tillämpningar inom området. Styrgruppen ska vara sammansatt så att den kan anlägga ett nationellt perspektiv och att ta en helhetssyn kring utvecklingen av den nationella infrastrukturen Myfab. Styrgruppen ska ha 5-8 ledamöter inklusive ordförande, varav Vetenskapsrådet ska nominera 2 ledamöter. Övriga universitet kan nominera 1 ledamot vardera. I styrgruppen ska finnas representanter för infrastrukturens användare. Styrgruppens ledamöter utses för perioden 2010-01-01 – 2012-12-31 med möjlig förlängning till 2014-12-31.

Föreståndare

Chalmers ska i samråd med Vetenskapsrådet utse en föreståndare med operativt ansvar för verksamheten. Föreståndaren ska vara forskare med stora kunskaper inom något av Myfab's områden. Föreståndaruppdraget bör utgöra ca 50-75% av en heltid.

Rådgivande organ

Styrgruppen ska utse en vetenskapligt rådgivande kommitté med uppgift att

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Vetenskapsrådet

följa upp verksamheten och ge råd för Myfab vetenskapliga och internationella utveckling. Kommittén ska vara oberoende med ledamöter från t ex internationella samarbetsorgan och internationellt ledande forskare inom mikro- och nanoteknik samt dess tillämpningar.

Styrgruppen utser en urvalsgrupp för vetenskaplig bedömning av inkomna ansökningar om tillgång till Myfabs resurser.

Användarforum

Inom Myfab ska senast från och med 2011 regelbundet arrangeras öppna användarmöten.

Avtal

Samverkansavtal

Förhållandet mellan Chalmers och övriga, i Myfab, deltagande universitet ska regleras i ett särskilt samverkansavtal som ska vara utformat så att det bidrar till att uppfylla de övergripande målsättningarna med Myfab. Samverkansavtalet ska utarbetas i samråd med Vetenskapsrådet.

Avtal för forskares nyttjande av Myfab

Chalmers ska i samråd med sina samarbetsparter och Vetenskapsrådet ta fram ett mall-avtal för att reglera villkoren avseende tillträde till laboratorier, rapportering av utnyttjande, arbetsmiljö och liknande för de forskare som nyttjar Myfabs resurser.

Styrdokument

Strategisk plan

Myfab ska ha en långsiktig strategisk plan för verksamhetens utveckling. Den strategiska planen ska fastställas av styrgruppen i samråd med Vetenskapsrådet och ska ses över årligen.

Den strategiska planen ska vara en bas för planeringen av verksamheten för hela perioden 2010-2014. Den bör ha ett femårsperspektiv och uppdateras efter utvärdering av verksamheten eller vid behov. En sådan strategisk plan för tiden fram t.o.m. 2014-12-31 ska vara Vetenskapsrådet tillhanda senast 2010-09-30.

Verksamhetsplan

En verksamhetsplan ska från och med hösten 2010 fastställas av styrgruppen senast den 1 december varje år för nästkommande års verksamhet. Verksamhetsplanen ska bland annat innehålla en uppsättning mätbara nyckeltal för verksamheten som ska återrapporteras. Den första



verksamhetsplanen som beskriver verksamheten för 2010 ska presenteras av Myfab senast den 30 september 2010.

Åtterrapporering

Myfab ska från och med 2011 årligen lämna en kortfattad rapport till Vetenskapsrådet om föregående års verksamhet inkluderande nedanstående punkter och de nyckeltal som anges i verksamhetsplanen.

- Antal användare (inklusive nya grupper)
- Större förändringar av organisationen
- Antal peer-reviewade artiklar relaterade till infrastrukturen
- Antal patent relaterade till infrastrukturen
- Ekonomisk redovisning inklusive vilka andra betydande bidrag som har sökts/fått
- Internationella kontakter/samarbeten
- Hur väl de vetenskapliga målen har uppnåtts (och/eller nya/reviderade mål)
- Större vetenskapliga genombrott
- Infrastrukturens betydelse för direkta samhällliga intressen.
- Infrastrukturens betydelse för näringsliv och kommersiella intressen.

Åtterrapporeringen ska vara Vetenskapsrådet tillhanda senast den 15 februari varje år.

Utvärdering

Vetenskapsrådet ansvarar för utvärdering av Myfab. Den sker med hjälp av extern expertis, normalt var tredje till sjätte år, och utgör en grund för beslut om fortsatt finansiering av verksamheten. Utvärderingen utformas av Vetenskapsrådet. Den första utvärderingen planeras att äga rum under 2012 men kan komma att tidigareläggas.

Avveckling av verksamheten

Om Vetenskapsrådet med stöd av utvärdering eller av annat skäl beslutar att avsluta sitt stöd till Myfab sker en nedtrappning av stödet under två år räknat från den dag då beslutet om avveckling togs. Neddragningen av stöd kan högst uppgå till 20% första året och 70% andra året.

Avvecklingsplan

Chalmers ska ansvara för att en avvecklingsplan finns. Avvecklingsplanen ska tas fram av styrgruppen och ska godkännas av Vetenskapsrådet och parterna i Myfab. Syftet med avvecklingsplanen ska vara att säkerställa en



Vetenskapsrådet

ordnad avveckling av verksamheten och bevarande av de resurser som utvecklats.

I avvecklingsplanen ska anges hur Myfab data, substansbibliotek, utrustning, personal och övriga resurser ska avvecklas, inklusive en detaljerad tidsplan för avvecklingen.

Återtagande av bidrag

Om Chalmers i väsentligt avseende bryter mot beslutsvillkoren och inte inom en månad (30 dagar) efter skriftlig anmaning upphör härmed, kan Vetenskapsrådet avsluta sina åtaganden med omedelbar verkan. Vid brott mot gjorda åtaganden gäller "Generella villkor för bidrag till forskning från Vetenskapsrådet, Forskningsrådet för arbetsliv och socialvetenskap (FAS) och Forskningsrådet för miljö, areella näringar och samhällsbyggande (Formas)".

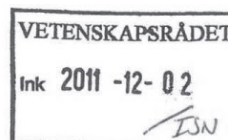
APPENDIX 4. MAX-LAB AGREEMENT



Vetenskapsrådet

Datum
2011-11-15

Diarienummer
827-2011-7680



Bidrag till drift av den nationella forskningsanläggningen MAX-laboratoriet i Lund

Bakgrund

MAX-IV Laboratoriet ska långsiktigt tillgodose det svenska behovet av infrastruktur för forskning med synkrotronljus och energirika elektroner. MAX IV Laboratoriet består av de nuvarande lagringsringarna MAX I-III (MAX-lab) och uppbyggnaden av den nya MAX IV-anläggningen. Lunds Universitet (LU) är värduniversitet för verksamheten vid MAX-IV Laboratoriet.

LU ska under den överenskomna perioden driva och utveckla MAX-lab som en nationell forskningsinfrastruktur. Vetenskapsrådet (VR) åtar sig att för den angivna tidsperioden finansiera MAX-lab inom de ramar som anges nedan. VR har intentionen att stödja drift av MAX-lab för att det fortsatt ska vara en framgångsrik nationell forskningsinfrastruktur tills att verksamheten flyttas över till den nya MAX IV-anläggningen. Uppbyggnad av MAX IV-anläggningen och införandet av en ny organisation vid MAX IV-laboratoriet regleras av en separat överenskommelse mellan VR, VINNOVA, Region Skåne och LU (LU Dnr 2010/551, alt VR dnr: 827-2010-6415). MAX-lab ska enligt denna överenskommelse ingå i MAX IV-laboratoriet från den 1 juli 2010.

Som utgångspunkt för drift och utveckling av MAX-lab finns PM om nationell forskningsinfrastruktur (VR dnr 811-2010-148), riksdagsförordningen (1994:946) och dess ändringar (1998:1007) (2000:1203), (2010:1786), samt Överenskommelsen om MAX IV-laboratoriet (LU Dnr 2010/551, alt VR dnr: 827-2010-6415).

Beslut

VR beviljar bidrag till LU för att driva och utveckla MAX-lab som en nationell forskningsinfrastruktur vars verksamhet syftar till att tillhandahålla expertis inom synkrotronljus och energirika elektroner. Målet är att bidra till att svensk forskning inom de områden där dessa tekniker används skall kunna vara världsledande.

LU ska ha arbetsgivaransvar för de anställda, tillhandahålla administrativ service samt ha det ekonomiska ansvaret för MAX-labs lokalkostnader

1 (6)



Vetenskapsrådet

Beslut och villkor för bidrag till MAX-laboratoriet, 827-2011-7680

inklusive driftskostnader (el).

VR lämnar för åren 2011-2012 bidrag till MAX-lab med 165 000 000 kronor fördelat enligt nedanstående tabell. Efter utvärdering under första halvåret 2012 kommer bidraget för nästa period att beslutas. LU ska bidra med resurser under åren 2011-2012 motsvarande ca 61 000 000 kronor fördelat enligt nedanstående tabell.

	2011 (tkr)	2012 (tkr)
VR	80 000	85 000
LU	29 000	32 000

VR:s bidrag kan komma att förändras under perioden om förutsättningarna för verksamhetens genomförande ändras avsevärt eller om VR:s anslag väsentligen minskar och driftsbidraget därmed måste inskränkas.

Per Eriksson
Rektor, Lunds universitet

Juni Palmgren
Huvudsekreterare, Rådet för forskningens infrastrukturer

2 (6)



Vetenskapsrådet

Beslut och villkor för bidrag till MAX-laboratoriet, 827-2011-7680

Villkor för bidrag

Nationell forskningsinfrastruktur

MAX-lab ska vara en resurs för forskare från universitet och högskolor över hela landet. Även forskare från andra länder ska kunna bedriva forskning vid laboratoriet.

Öppen tillgänglighet

MAX-lab ska ge akademiska forskare öppen tillgång till och kvalificerad service för att använda infrastrukturen oavsett akademisk institution. Akademisk forskning ska prioriteras framför kommersiell verksamhet.

Prioritering av projekt och fördelning av resurser ska göras på ett tydligt och transparent sätt baserat i första hand på vetenskaplig kvalitet. Riktlinjer för prioritering ska finnas i den strategiska planen för MAX-lab.

Datahantering

Forskningsresultat från verksamheten vid MAX-lab ska publiceras i enlighet med VR:s regler om open access. Hinder mot publicering föreligger främst om publicering skulle utgöra hinder vid immaterialrättsligt skydd av resultat. Vid nyhetsk hinder kan forskaren begära hos styrelsen att publicering fördröjs under maximalt tre månader från begäran.

Kvalificerat användarstöd

MAX-lab ska tillhandahålla kvalificerat användarstöd - både rådgivande och operativt. Stödet ska vara utformat så att användare över hela landet som behöver utnyttja infrastrukturen ska kunna bedriva vetenskaplig forskning av hög kvalitet utan att själva behöva vara experter på den specifika instrumenteringen och metoden.

Utbildning

MAX-lab ska ge utbildning relaterad till användningen av infrastrukturen. MAX-lab ska också samverka med relevanta forskarskolor och andra utbildningsinsatser.

Kommunikation

MAX-lab ska löpande informera potentiella användare om infrastrukturens möjligheter.

Nya möjligheter och viktigare forskningsresultat som erhållits med hjälp av infrastrukturen ska aktivt kommuniceras till forskarsamhället, berörda myndigheter och till den intresserade allmänheten.

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Vetenskapsrådet

Beslut och villkor för bidrag till MAX-laboratoriet, 827-2011-7680

Internationell verksamhet

MAX-lab ska delta i internationella samarbeten och vara en konkurrenskraftig och attraktiv svensk nod för internationellt forskningssamarbete inom synkrotronljusbaserad forskning och teknik och utnyttjandet av dessa tekniker. MAX-lab ska också, på uppdrag av VR, kunna representera Sverige i internationella samarbeten inom laboratoriets verksamhetsområden.

Särskilda begränsningar

Forskningsprojekt som utnyttjar resurserna vid infrastrukturen ska inte ingå i MAX-labs verksamhet. De resurser och tillgångar inklusive utrustning som ingår i MAX-lab ska framgå av laboratoriets inventarieförteckning samt rapportering.

Organisation

MAX-lab ska drivas som en tydligt avgränsad verksamhet inom MAX IV-laboratoriet vid LU. Den operativa verksamheten bedrivs på uppdrag av styrelsen för MAX IV-laboratoriet. Organisationen, inkl styrelsens ansvar, uppgifter och sammansättning, direktör och ledningsgruppens ansvar och uppgifter, rådgivande organ m m regleras av Överenskommelsen om MAX IV-laboratoriet (LU Dnr 2010/551, alt VR dnr: 827-2010-6415).

Användarforum

MAX-lab ska årligen arrangera öppna användarmöten.

Avtal

Samverkansavtal

Avtal mellan LU och andra organisationer avseende MAX-labs verksamhet enligt detta avtal ska i förekommande fall regleras i särskilda samverkansavtal som ska vara utformade så att de bidrar till att uppfylla de övergripande målsättningarna för MAX-lab.

Avtal för forskares nyttjande av MAX-lab

LU ska i samråd med VR ta fram ett avtal som ska reglera externa användares nyttjande av MAX-lab.

Styrdokument

Strategisk plan

MAX-lab ska ha en långsiktig strategisk plan för verksamhetens utveckling. Den ska ingå som en del av MAX IV-laboratoriets

4 (6)



Vetenskapsrådet

Beslut och villkor för bidrag till MAX-laboratoriet, 827-2011-7680

strategiska plan och fastställas av MAX IV-styrelsen och ska ses över årligen.

Den strategiska planen ska utgöra en bas för den långsiktiga planeringen av verksamheten och innehålla tydliga prioriteringar av verksamheten och den vetenskapliga utrustningen. Planen skall dels innefatta prioriteringar av användning och utveckling av faciliteterna vid MAX-lab. Planen bör minst ha ett perspektiv till 2015 och uppdateras årligen. En sådan strategisk plan ska vara VR tillhanda senast 2012-03-15.

Verksamhetsplan

En verksamhetsplan ska fastställas av MAX IV-laboratoriets styrelse senast den 1 december varje år för nästkommande års verksamhet, 2012 års verksamhetsplan skall vara Vetenskapsrådet tillhanda senast 2012-03-15. Verksamhetsplanen ska bland annat innehålla en uppsättning mätbara nyckeltal för verksamheten som ska återrapporteras.

Återrapportering

MAX-lab ska från och med 2011 årligen lämna en kortfattad rapport till VR om föregående års verksamhet inkluderande nedanstående punkter och de nyckeltal som anges i verksamhetsplanen. Rapporteringen kan utgöra en del av MAX IV-laboratoriets rapportering till Finansiärsforum för MAX IV-laboratoriet.

- Antal användare (inklusive nya grupper)
- Större förändringar av organisationen
- Antal peer-review artiklar relaterade till infrastrukturen
- Antal patent relaterade till infrastrukturen
- Ekonomisk redovisning inklusive vilka andra betydande bidrag som har sökts/erhållits
- Internationella kontakter/samarbeten
- Hur väl de vetenskapliga målen har uppnåtts (och/eller nya/reviderade mål)
- Större vetenskapliga genombrott
- Infrastrukturens betydelse för direkta samhälleliga intressen.
- Infrastrukturens betydelse för näringsliv och kommersiella intressen.

Återrapporteringen ska vara VR tillhanda senast den 25 februari varje år.

Utvärdering

VR ansvarar för utvärdering av MAX-lab. Den sker med hjälp av extern expertis, normalt vart tredje till sjätte år, och utgör en grund för beslut om fortsatt finansiering av verksamheten. Utvärderingen utformas av VR

5 (6)



Vetenskapsrådet

och kommer att samordnas med utvärdering av MAX IV-laboratoriet.

Avveckling av verksamheten

Om VR med stöd av utvärdering eller av annat skäl beslutar att minska sitt stöd till MAX-lab med mer än 33% jämfört med föregående år sker en nedtrappning av stödet under två år räknat från den dag då beslutet om avveckling togs. Neddragningen av stöd kan högst uppgå till 20% första året och 70% andra året.

Avvecklingsplan

LU ska ansvara för att en avvecklingsplan finns. Avvecklingsplanen ska tas fram av styrelsen och ska godkännas av VR. Syftet med avvecklingsplanen ska vara att säkerställa en ordnad avveckling av verksamheten och bevarande av de resurser som utvecklats.

I avvecklingsplanen ska anges hur laboratoriets utrustning, personal och övriga resurser ska avvecklas, inklusive en detaljerad tidsplan för avvecklingen.

Återtagande av bidrag

Om LU i väsentligt avseende bryter mot beslutsvillkoren och inte inom en månad (30 dagar) efter skriftlig anmaning upphör härmed, kan VR avsluta sina åtaganden med omedelbar verkan. Vid brott mot gjorda åtaganden gäller "Generella villkor för bidrag till forskning från VR, Forskningsrådet för arbetsliv och socialvetenskap (FAS) och Forskningsrådet för miljö, areella näringar och samhällsbyggande (Formas)".

APPENDIX 5. SELF-EVALUATION FORM



Vetenskapsrådet

2012-05-11

Swedish Research Council

Evaluation of 11 national research Infrastructures 2012

Self-evaluation Research Infrastructures

Please save the self-evaluation report (including the questions below) as a **pdf-document** including appendices (A-C). Make sure to follow the instructions about the length of the answers for each question. **The document should not exceed more than 10 pages in length** (excluding appendices). The self-evaluation report should be submitted to Eva Mineur eva.mineur@vr.se, at the Swedish Research Council no later than **June 15, 2012**.

Questions to: Eva Mineur, eva.mineur@vr.se 08-546 44 250, 0765-267 250 or Bo Sandberg bo.sandberg@vr.se 08-546 44 276, 0765- 267 276.

Name of the infrastructure and contact information

Organisation and operations

1. Briefly summarise the most important aspects of the infrastructure's long-term strategy **Maximum 0.5 page** (Attach the most recent Long-term Strategy for the infrastructure, in English, Appendix A)
2. Briefly summarise the activities during 2011 and the operational plan for 2012 with focus on the most important work/projects of the infrastructure. **Maximum 0.5 page** (Attach Organisational Chart that illustrates the connection between infrastructure's board and the host university, Appendix B. Also, attach the operational/*Verksamhets* Plan for 2012, in English. Appendix C)
3. Have there been any significant changes in the goals, strategy or operations since 2009? Please comment on the presence or absence of such changes. **Maximum 0.5 page**



4. Financial overview of the infrastructure– please fill out Table 1.

Table 1: Financial overview

	2009	2010	2011	2012	2013	2014	2015
Funding from Swedish Research Council (kkkr)							
Funding from host university (kkkr)							
Funding from partner universities (if applicable) (kkkr)							
Other funding* (kkkr)							
Total Operational Costs (kkkr)							
Total Equipment Costs (kkkr)							

Comment on the financial overview and * specify other sources of funding **Maximum 0.5 page**



Access to the infrastructure

5. Describe the use of the infrastructure by filling out Table 2, below. Use the most appropriate unit(s) to describe the use (projects, individuals, and/or groups)

Table 2: User overview

Unit	Number of new research activities during 2011	Number of research activities with PI:s from the host university during 2011	Number of research activities representing non-university organisations (for example industry) during 2011	Total research activities projects during 2011
Research Projects				
Individuals				
Research Groups				

Please comment on present use of and access to the infrastructure in relation to

- a) Its capacity
- b) The originally expected use
- c) Academic versus industrial usage distribution

Maximum 0.5 page

6. Briefly describe the demographic and gender distribution of PI: s of the research projects using the infrastructure (per node if applicable). Describe if there is any strategy to change these distributions. **Maximum 0.5 page**
7. Describe the prioritization strategy and process for allowing research projects access to the infrastructure. **Maximum 0.5 page**



9. Describe what educational efforts have been made by or in close collaboration with the infrastructure? **Maximum 0.5 page**

Access to data and research results

10. Describe the status for access to data generated within the infrastructure. **Maximum 0.5 page**

Collaborations

11. Describe the nodes connected to and/or affiliated with the infrastructure and their different profiles. Describe how the nodes complement each other and how distribution of resources is optimised within the infrastructure. What is the status of consortium agreements?
Maximum 0.5 page
12. Describe national and international collaborations. **Maximum 0.5 page**

Results and outcomes

13. What kind of feedback/report system do you have for keeping track of research publications associated with the infrastructure? **Maximum 0.5 page**
14. Has there been any major research breakthroughs made thanks to the research infrastructure? If so, describe those breakthroughs. **Maximum 0.5 page**
15. Describe the infrastructure's contribution to scientific progress in an international perspective
Maximum 0.5 page



Vetenskapsrådet

2012-05-11

Swedish Research Council

Evaluation of 11 national research Infrastructures 2012

Communication strategy

17. Briefly describe the communication strategy of the infrastructure and what efforts are made to communicate research results and promote use of the infrastructure to

- a) The research community
- b) Interests outside the research community

Maximum 0.5 page

SWOT Analysis

18. Please identify and discuss the Strengths, Weaknesses, Opportunities and Threats of or to the infrastructure. **Maximum 1 page**

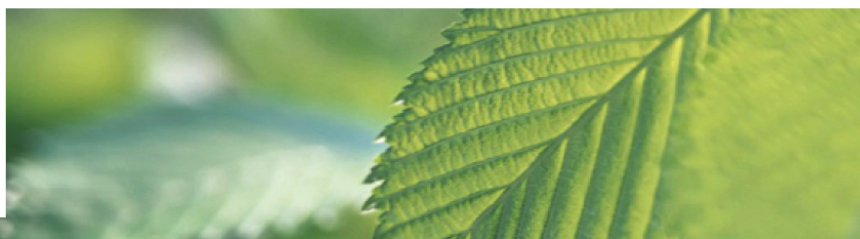
Appendices

A – Long-term Strategy

B – Organisational Chart

C – Operational Plan for 2012

APPENDIX 6. USER SURVEY



User Survey Research Infrastructures

The Swedish Research Council is evaluating 11 national infrastructures. The overall aim of the evaluation is to evaluate the outcome and performance of the infrastructures. The results are expected to provide the Council for Research Infrastructure with a decision basis for further funding and measures for improvement. The evaluation includes a user perspective on the national accessibility and the level of use of the infrastructures.

Your participation is a much valued input to the evaluation. The questionnaire takes about 5-10 minutes to complete. We ask you to participate in the study even if you have not used any of the infrastructures.

Participation is voluntary and all answers will be anonymized in the result presentation.

If you have any questions about the user survey, please contact Bo Sandberg by e-mail bo.sandberg@vr.se. For question regarding the evaluation of national infrastructures in Sweden, please contact project leader Eva Mineur, eva.mineur@vr.se

1. Which research field suits best to describe your area of research?

- Social Sciences and Humanities
- Medicine
- Natural Sciences
- Engineering

2. Have you used any of these infrastructures?

Please check the infrastructure(s) you have used

- Yes, ICOS
- Yes, LifeWatch
- Yes, ECDS
- Yes, BBMRI
- Yes, BILS
- Yes, SuperAdam
- Yes, CBCS
- Yes, SNISS
- Yes, PRACE
- Yes, MyFab
- Yes, MaxLab
- No

3. Which of the infrastructures have you used the most?

- ICOS
- LifeWatch
- ECDS
- BBMRI
- BILS
- SuperAdam
- CBCS
- SNISS
- PRACE
- MyFab
- MaxLab

Please continue to use the infrastructure chosen in question 3 when you answer the following questions in the survey

4. Which university/organisation were you representing when using the infrastructure selected in question 3?

If needed, please select multiple universities/organisations.

- Karolinska Institutet
 - Uppsala university
 - Lund university
 - Stockholm university
 - Umeå university
 - KTH Royal Institute of Technology
 - SLU Swedish University of Agricultural Sciences
 - Chalmers university of technology
 - Linköping university
 - Other organisation, please specify
-

5. How would you rate the accessibility to the infrastructure?

The infrastructure is supposed to be open and easily accessible for researchers.

- Excellent
- Very good
- Acceptable
- Not so good
- Not good at all
- I do not know

Please comment on the accessibility to the infrastructure

6. How did you first gain knowledge about the infrastructure?

- Research colleagues
- Information direct from the research infrastructure
- Information from the Swedish Research Council
- From another source
- I do not know

7. Do you know what the evaluation process looked like and by which criteria your application to access the infrastructure was evaluated?

- Yes
- No
- My application was not evaluated

Please comment on the process and criteria upon which research is granted access to the infrastructure

8. Have you been informed about the conditions for data accessibility at the infrastructure?

As a basic principle, data produced at the infrastructure should be open and easily accessible for other researchers. (Restrictions may obviously apply for certain kinds of data.)

- Yes
- No
- I do not know

Please comment on the accessibility of data produced at the infrastructure

9. How would you rate the services provided by the infrastructure regarding scientific consultation?

The infrastructure should offer qualified service in terms of consultation for users.

- Excellent
- Very good
- Acceptable
- Not so good
- Not good at all
- I do not know

Please comment on the services provided by the infrastructure regarding scientific consultation/advise

10. How would you rate the services provided by the infrastructure regarding operational use?

The infrastructure should offer qualified service and user support for its operational use

- Excellent
- Very good
- Acceptable
- Not so good
- Not good at all
- I do not know

Please comment on the services provided by the infrastructure regarding operational use

11. Have you participated in any training offered by the infrastructure

Infrastructures should offer training relevant to the use of the infrastructure

- Yes
- No
- Have not been offered any training

12. How would you rate the training provided by the infrastructure

- Excellent
- Very good
- Acceptable
- Not so good
- Not good at all

Please comment on the training provided by the infrastructure

13. Have you been invited to participate in any user forums/meetings arranged by the infrastructure?

User forums may also be called open meetings or(öppna) användarmöten

- Yes
- No
- I do not know

Please comment on the relevance, content, quality and usefulness of the user forum

14. In your opinion, are there any limitations in gaining access to the infrastructure?

- Yes
- No
- I do not know

15. What are the limitations in gaining access to the infrastructure?

- The user fees
- Long waiting times at the infrastructure
- Inadequate training at the infrastructure
- Inadequate support at the infrastructure
- Inadequate assessment of the quality of research applications for access to the infrastructure
- Other difficulties

Please comment on any experienced limitation in gaining access to the infrastructure

16. If you have any further comments or information you would like to provide to the evaluation team, please use the textbox below

Thank you for your participation!

APPENDIX 7. SHORT CVS OF PANEL MEMBERS

Short CVs of the Panel members

Panel A

Susanne Holmgren, Professor emerita Zoo physiology Department of Biological and Environmental Sciences, University of Gothenburg (Chair)

Areas of interest: Comparative studies of the distribution and function of gut neurons

Webpage: http://www.bioenv.gu.se/english/staff/Holmgren_Susanne/?languageId=100001&contentId=-1&disableRedirect=true&returnUrl=http%3A%2F%2Fwww.bioenv.gu.se%2Fpersonal%2FHolmgren_Susanne%2F

Michael Schultz, Dr. Head of National Capability, Natural Environment Research Council, U.K.

Areas of interest: UK and European infrastructures for research on all aspects of environmental science – covering the geosphere, biosphere, cryosphere and atmosphere

Webpage: <http://www.nerc.ac.uk/research/sites/facilities/>

Russ Schnell, Dr. Deputy Director, Global Monitoring Division, National Oceanic & Atmospheric Administration, U.S.A

Areas of interest: Global Atmospheric Baseline Observatory operations, GMD management and budgets, Carbon and ozone cycle measurements and analyses.

Webpage: <http://www.esrl.noaa.gov/gmd/staff/Russell.C.Schnell/>

Mari Walls, Professor Director, Marine Research Centre, Finnish Environment Institute, Finland

Areas of interest: Biodiversity, environmental research, aquatic ecology, life cycle ecology, ecosystem approach to management

Webpage: <http://www.ymparisto.fi/scripts/hapa/h.asp?Method=PERSONFORM&txtuserid=11376&txthaku=&txtlang=EN&txtselsuborgid=252&txtofficeid=&txtorgid=10>

Panel B

Tuula Teeri, Professor and President at Aalto University, Finland (Chair)

Areas of interest: Enzymology of plant cell wall degradation and biosynthesis, forest industrial biotechnology, protein engineering.

Webpage: <http://www.aalto.fi/en/about/organization/presidents/>

Eckhart Curtius, Deputy Head of Division, Federal Ministry of Education and Research, Germany

Areas of interest: European Administrative Law; European Research policy under FP7 and Horizon 2020; Pan-European Infrastructures in the field of BMS

Webpage: www.bmbf.de

Taina Pihlajaniemi, Professor and Vice Rector at the University of Oulu, Finland.

Areas of interests: Extracellular matrix biology, cancer and stem cell biology, European research infrastructures in biological and medical sciences

Webpage: <http://www oulu.fi/biocenter/personnel/taina-pihlajaniemi>

Panel C

Odd Ivar Eriksen, Special Adviser, The Research Council of Norway, Division for Science, Department for Research Infrastructure. Delegate to ESFRI. (Chair)

Areas of interest: National and European research infrastructures

Webpage: http://www.forskningsradet.no/prognett-infrastruktur/Home_page/1224697900438

Aaron Stein, Nanofabrication Facility Leader, Center for Functional Nano materials, Brookhaven National Laboratory, USA

Areas of interest: electron beam lithography, nanofabrication, x-ray optics, user facility management

Webpage: http://www.bnl.gov/cfn/people/Aaron_Stein.asp

Cherri M. Pancake, Dr. Professor of EECS and Intel Faculty Fellow, Oregon State University

Areas of interest: usability engineering, cyber infrastructure, virtual communities, high-performance computing

Webpage: <http://eecs.oregonstate.edu/people/pancake>

Doris Keitel-Schulz, Owner dksst-consulting and partner dpm-tec. Advisor to start ups and research organizations. Former Senior director R&D Qimonda Flash and President of Qimonda Italy.

Areas of interest: all aspects of ICT products and industries and all aspects of renewable research

Web-pages: <http://www.dksst-consulting.de>, <http://www.dpmtec.de>