Ministry of Higher Education and Science Denmark

Panel report

Review of the Danish model for research-supporting activities

April 2020

Introduction by the Chair of the panel

This report presents the views of an international independent review panel, established upon the request by the Danish Agency for Science and Higher Education (DAFSHE). The review had as its purpose to scrutinise the Danish "research supporting centres".

The three existing centres are a rather unique construction in an international comparison, given that their purpose is to focus systematically on the Danish national access and use of large international research infrastructures, providing researchers with world-leading experimental and educational facilities. This report describes in detail the overall findings of the review, as well as a few recommendations on how to develop this successful model even further to take advantage of investments in international research infrastructures.

While DAFSHE has acted as secretariat to the panel, including drafting this report, this report represents the independent views of the panel reached in consensus.

The panel found great pleasure in participating in the review, with an interview-based approach that worked very well for fostering good discussions with the relevant research communities during the interviews as well as in the panel. All the panel members have expressed their willingness to participate in a similar review again.

I would like to thank all the panel members for their very active engagement in the review, and the panel is obliged to all the Danish research communities involved in the review for their very constructive contributions and readiness to deliver input to the review. The panel has also highly appreciated the support by DAFSHE throughout the review, which made our work smooth and fun.

Professor Aleksandar Matic, Chair of the panel
30th March 2020

Content

Executive summary

The panel finds that the model for the research supporting centres is working very well, and that both the existing centres and the ministry should be very pleased with its successes. It provides significant value for relatively modest funding. Therefore, the panel recommends that, overall, DAFSHE should continue to fund research-supporting activities based on the current model.

Some of the most important results of the existing centres are that they:

- Contribute to building coherent national research communities that are essential for the engagement in the international infrastructures.
- Coordinate and summarise the common national research interests.
- Enable a direct dialogue between the ministry and the research communities on strategic matters of national interest.

The panel also sees a potential to improve the work of the centres and to establish new centres. Some of the panel's general recommendations are:

- The existing centres should continue with their current activities but create more awareness about their accomplishments for Danish research.

- DAFSHE should encourage additional work on the opportunities for establishing one new centre for molecular biology/EMBL and one new centre for fusion research including ITER/F4E. Funding for new centres should not be taken from the existing centres since that will harm the good results of the existing ones.

- The centres should formulate five-year work plans within a clear strategic framework, work with a five-year funding perspective and be reviewed in-depth every three to five years.

- All the centres should formulate strategies for Danish use of the international research infrastructures and/or for the development in the relevant Danish scientific communities.

- The centres should focus on disseminating the opportunities at the large international research infrastructures, in particular for education and training, of which Denmark currently does not seem to take full advantage.

- The centres should set individual clear and consistent Key Performance Indicators (KPIs) that reflect the long-term plans and, if relevant, national strategies.

- Funding should continue from a closed budget envelope in the National Budget for specific, named centres. The envelope could be increased by moving funds from the investments in new national research infrastructures to the centres, in an effort to optimise the existing investments in international research infrastructures. Co-funding should not be pursued as a means to increase the budget for the centres.

Sections 1-2 of this report give the background for the research-supporting centres, and the individual setting for the existing and prospective centres.

Section 3 describes the method of the review.

The recommendations stated above are elaborated in sections 4-5, whereas specific recommendations to the individual centres are given in section 6.

Panel Composition

Professor Aleksandar Matic, Department of Physics, Chalmers University of Technology	Chair of the panel and covering the Material Sciences research area
Dr. Oliver Bunk, Head of the Laboratory for Macromolecules and Bioimaging (LSB), Paul Sherrer Institute	Member of the panel and covering the Material Sciences research area
Professor Per Lilje, Institute of Theoretical Astrophysics, University of Oslo	Member of the panel and covering the Astrophysics research area
Professor Torsten Åkesson, Division for Particle Physics, Lund University	Member of the panel and covering the High Energy Physics research area
Professor Eirikur Steingrimsson, Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Iceland	Member of the panel and covering the Molecular Biology research area
Professor Pär Strand, Director of Chalmers e-Science Centre, Department of Space Earth and Environment, Astronomy and Plasma Physics, Plasma Physics and Fusion Energy	Member of the panel and covering the Fusion Energy research area

1. Background: the model for research-supporting activities

The research-supporting centres are national activities, which are closely linked to the Danish memberships of international research infrastructures. The background hereof and the reviews of the activities in the recent years are provided in this section.

1.1 Research-supporting activities and the large international research infrastructures

Denmark is a member of eight large international research infrastructures:

Table 2
Danish memberships of large international research infrastructures

CERN	The European Organisation for Nuclear Research
ESO	The European Southern Observatory
EMBL	The European Molecular Biology Laboratory
ESS	The European Spallation Source
ESRF	The European Synchrotron Radiation Facility
European XFEL	The European X-Ray Free-Electron Laser Facility
ILL	The Institut Laue-Langevin
ITER/F4E	The International Thermonuclear Experimental Reactor – ITER and its European party Fusion for Energy - F4E

In 2020, Denmark contributes approx. 430 million DKK in direct membership contributions to the above-mentioned research infrastructures. The memberships of the research infrastructures enable Danish researchers to conduct their research and experiments at the facilities, e.g. via peer review applications or via long-term engagements to experiments and/or building particular instruments.

"Research-supporting activities" is a term used to define activities that lie between actual research activities and the operation of the large international research infrastruc-

tures. Research-supporting activities in Denmark are currently organised via three national centres. The following table gives an overview of the three centres and the international research infrastructure memberships they support[1]:

Table 3
Overview of existing centres and the international research infrastructures they support.

Centre	International membership(s)	Research area	Host university	Website
Danish Instrument Center for the use of X-ray, synchrotron and neutron sources – DANSCATT	ESRF, ESS, European XFEL, ILL	Research in materials within the technical, natural and life sciences	Danish Technical University - DTU	http://www.danscatt.dk/
Danish Instrument Center for Astrophysics – IDA	ESO, NOT, ESA	Astrophysics	Aarhus University - AU	http://phys.au.dk/ida/
National Instrument Center for CERN Experiments – NICE	CERN	High-energy physics etc.	University of Copenhagen - KU	https://nice.ku.dk/

The funding and organisation of Danish research-supporting activities have been changing in the last decade or so. A short historical overview is given in table on the following page.

The centres for research-supporting activities have as their main purpose to facilitate access for Danish researchers to the international research infrastructures. The term "access" is to be understood broadly and relative to the different modalities of the infrastructures. The centres can e.g. cover travel costs for researchers to peer reviewed allocation of experimental time at the facilities, or they can cover the costs of technical Postdocs fulfilling part of a mandatory operational duty cycle implied by the Danish membership. On the other hand, the centres cannot fund the actual research performed at the research infrastructures with the funding that the centres receive from the ministry.

The centres are national, and, on behalf of the relevant universities, they coordinate the Danish scientific interests towards the research infrastructures, e.g. via national annual meetings. Further, the centres serve as advisors to the Danish Ministry for Higher Education and Science, particularly in terms of maximising the impact of the Danish access to the facilities.

[1] ESA is included in the table under IDA. ESA undertakes, but is not exclusively restricted to, a scientific programme, and has a much broader scope than a research infrastructure. The membership fee for ESA is not included in the 430 million DKK mentioned above. Of the Danish contribution to ESA In 2020, approximately 79 million DKK directly supports basic research in the Space Science Programme.

Table 4
Historical overview of the model for research-supporting activities

Period	Funding and organisation of the activities
Until 2012	Research-supporting activities are funded by the Danish Independent Research Fund Denmark (formerly named the Danish Independent Research Council).
2012	A working group is formed to produce a report with recommendations about Danish research-supporting activities and researchers' access to and use of international research infrastructures. Based on the recommendations, funding is moved from the research council to the national fund for research infrastructures.
2013-2016	Research-supporting activities are funded by DAFSHE via the national fund for research infrastructures in the National Budget.
2016	In cooperation with the Danish National Committee on Research Infrastructures (NUFI), the Danish Agency for Science and Higher Education (DAFSHE) reviews the funding and organisation of research-supporting activities. Funding is moved from the national fund for research infrastructures to a separate funding envelope for research-supporting activities in the National Budget and funding decisions are now made by DAFSHE after advice from NUFI.
2017-2020	The centres are funded by annual grants from DAFSHE based on the three-year proposals plus annual proposals for funding and activities.
2019-2020	An international panel is formed to recommend DAFSHE on the future model for research-supporting activities including the need for new centres. This report presents the panel's recommendations.

1.2 Reviews in the past

The 2016 review of the centres (mentioned in the table above) resulted in a new framework, which from 2017 regards the three centres under the same purpose, activities and organisational model. They were also brought under the same national envelope on the national budget. Based on three-year activity plans, the centres submit proposals for funding every year. After advice from NUFI, the directors of DAFSHE decide on the distribution of the funding between the centres from the common funding envelope. The amount of funding for each centre has varied over the past years but been relatively stable since 2017 as presented in the table below:

Table 5
Funding for existing research-supporting centres (in million DKK)

	2016	2017	2018	2019	2020
Total	12,8	12,9	13,1	13,2	13,4
DANSCATT	4,0	4,45	4,45	4,55	4,55
IDA	1,75	1,3	1,5	1,5	1,55
NICE	6,95	7,15	7,15	7,15	7,3

The 2016 model also introduced the requirement that 65 % of the funding of a centre must be used for access-giving activities. The remaining 35 % can be more freely spent on activities within the purpose of the centres and within the centres' approved activity plans – thus allowing the centres some freedom with respect to the differences among the different research infrastructures and traditions in the research areas.

In addition to the 2016 review, the context of the three centres was reviewed in 2017-2018 as part of a major impact assessment of the Danish memberships of international research infrastructures. One conclusion from the assessment was that the centres are crucial for the impact of the Danish memberships. At the same time, it was noted that neither EMBL nor F4E/ITER have associated centres, and the need thereof should be assessed.

In 2018, DAFSHE published an action plan[2] based on the assessment. The action plan included as an action this review of the research-supporting centres, including an assessment of the need for additional centres. It therefore serves as the basis for DAFSHE initiating this review.

[2] https://ufm.dk/en/publications/2019/english-summary-action-plan-for-the-danish-memberships-of-large-international-research-infrastructures

2. Introduction to the research-supporting centres and relevant research communities

While the current three research-supporting centres are considered under the same framework, the centres carry some differences, which merits descriptions of their individual settings. Likewise, the potential new centres in relation to EMBL and F4E/ITER would most likely also be different from each other and the existing centres. The reasons for the differences are linked to the differences between the research infrastructures and how they operate, and to the organisation of the relevant research communities.

This section gives a brief introduction to the settings of each of the centres and the relevant research communities. It should be noted that the centres and research communities use different methods to count and present the number of researchers, students, etc. covered by them. Therefore, the numbers are not fully comparable between the centres and research communities.

2.1 Danish Instrument Center for the use of X-ray, synchrotron and neutron sources – DANSCATT

2.1.1 Purpose

The aim of DANSCATT is to facilitate and optimize the Danish use of international research infrastructures based on neutrons, synchrotron X-rays or X-ray free electron lasers. DANSCATT supports the memberships of the present and future world leading facilities ESS, ESRF, ILL and European XFEL. Furthermore, DANSCATT supports Danish researchers' use of other international scattering facilities such as PSI, SNS and FRM II.

2.1.2 Relevant research community

DANSCATT estimates that ~97 % of all Danish users of the international facilities are members of DANSCATT. At the end of 2018, DANSCATT comprised of 580 researchers, from tenure staff to master students, and including technical personnel. These cover a very broad range of scientific areas spanning from technical sciences to natural sciences and life science and cover 20 institutes at 5 different Danish universities. The number of users has grown substantially since year 2000, and DANSCATT expects the

growth to continue, e.g. as the beam lines become increasingly available to new disciplines. In addition, the Danish national strategy for ESS prescribes a significant increase in the number of neutron users as ESS comes close to operation and DANSCATT plays a key role in this respect.

The Danish memberships of the international research infrastructures provide Danish users with access to the most ambitious experimental facilities. Access to worldwide leading facilities is also a necessity to attract research funding and to attract or keep dedicated expert users (so-called super users, who may also be charged with education, industry collaborations, and the progress of the entire community). It should also be noted that Danish users spend 70 % of the total beam time at around 20 facilities, of which Denmark is not a member. This represents a large additional value for Danish research and is vital to the success of DANSCATT.

2.1.3 Governance

The DANSCATT board consists of 13 members from research institutes and industry. The board represents the diverse research community and includes all relevant Danish universities and research disciplines.

Included in the board members are the Danish scientific delegates to the governing bodies of the research infrastructures of which Denmark is a member, and DAFSHE participates in the board meetings as observers.

As DANSCATT cannot address all members directly, a contact person is identified at each institute. The board continuously evaluates the contact needs. Close dialogue between DANSCATT and DAFSHE is also essential, in particular in relation to the DANSCATT strategy and the national ESS strategy.

2.1.4 Activities

DANSCATT acts as a network, with focus on education of the next generation of scientists and on informing and guiding new user groups. The DANSCATT activities are centred on an annual meeting, the board meetings, a website and a secretariat.

As a very efficient tool to increase Danish users' access to international research infrastructures, DANSCATT offers travel grants for proposals that have passed through peer review. Alternative sources of travel funding take precedence, e.g. the travel funding provided by ESRF via the membership fees.

DANSCATT also funds two Postdocs at PSI. While this transpired out of historical reasons, the PSI collaboration is today instrumental for Danish researchers, master and PhD students to gain access to PSI including training opportunities and it has led to many strong collaborations between Denmark and Switzerland.

DANSCATT includes users and board members from structural biology groups that make use of beam lines provided by EMBL at ESRF and DESY/PETRA III. Thus, while there is currently no research-supporting centre for EMBL, part of the EMBL research community is supported by DANSCATT.

2.2 Danish Instrument Center for Astrophysics – IDA

2.2.1 Purpose

IDA works to support Danish astronomers' use of the international research infrastructures, primarily ESO and the Nordic Optical Telescope (NOT). IDA is also coordinating links between space missions for astrophysics (specifically by European Space Agency – ESA) and the ground-based facilities. IDA's work is prioritised according to national interests.

2.2.2 Relevant research community

All four relevant Danish universities are involved in IDA: Aarhus University – AU, University of Copenhagen – KU, University of Southern Denmark – SDU and the Technical University of Denmark – DTU. IDA covers some 190 researchers, staff and students, spread across research groups at the universities: approx. 45 at AU, 75 at KU, 25 at SDU, and 45 at DTU.

The access to the large international research infrastructures enables Denmark to attract strong foreign candidates to the Danish research groups, as they are seen as attractive research environments on an international scale.

2.2.3 Governance

IDA is organised with a Board, an Executive Committee and 11 working groups that focus on strengthening the collaboration between the Danish academic environments working in astronomy and astrophysics.

IDA Board consists of a maximum of 24 members who are appointed and elected in the following ways:

- The four participating universities appoint seven representatives as members of the Board. The Head of IDA is automatically a member of the Board and chairs it.
- Ten members are elected among the astronomers in Denmark to the Board. This election supports diversity in the composition of the board and all students and researchers, who are affiliated with a Danish research institution, may stand for election.
- Finally, up to seven members are appointed based on the so-called 'convention-borne' memberships by ESO and NOT. These members are the Danish delegates in the following bodies: ESO Council, Scientific Technical Committee (STC), Observing programmes Committee (OPC) and Users Committee (UC), NOT Council, STC and OPC.

The detailed election procedure and the rules of procedure for both the Board and the Executive Committee are defined in the IDA Consortium Agreement.

2.2.4 Activities

IDA covers trips to NOT for Danish astronomers and expenses for so-called service observations, fast track and target-of-opportunity. IDA only covers trips and service fees in connection with observations, which have been obtained in open competition via peer review in the NOT Observing programmes Committee (OPC).

Trips to ESO are generally supported by the Danish ESO membership, and are therefore not included in the IDA budget.

IDA also focuses on supporting young talented researchers' (Postdocs and PhD students) use of telescopes around the world and in space. This is done, e.g. by IDA organising a national observing school for observational astrophysics at Master's and PhD level every year. The initiative ensures that young researchers in Denmark can make use of the opportunities offered at NOT, with the aim of providing students with skills in all basic aspects of a contemporary observation project in astronomy. The core of the observing school is an observing trip to NOT at La Palma, as well as remote observations with the Hertzsprung SONG telescope in Tenerife.

Lastly, it should be noted that IDA forms an interface between the research community and the research infrastructures and that IDA contributes with strategic evaluations and decisions between the individual universities. Therefore, IDA is able to provide DAFSHE with advice on behalf of the entire research community.

2.3 National Instrument Center for CERN Experiments – NICE

2.3.1 Purpose

NICE is the national platform for supporting and promoting the utilisation of CERN. As such, the centre is focused on utilising the accelerator complex of CERN, which includes the flagship Large Hadron Collider (LHC), the most powerful accelerator in the world, and the various other unique accelerators that operate in fixed target mode at different energies such as the SPS, HIE-ISOLDE and the antiproton facility ELENA. NICE also covers Danish participation in CERN experiments.

2.3.2 Relevant research community

NICE includes all experimental users of CERN in Denmark. The total number of Danish users related to CERN, including the Danish theoretical physicists relying on CERN, is estimated to be approx. 200 persons (however, theoretical physics is not formally included in NICE). For historical reasons, the groups carrying out research at the energy frontier with the LHC are located at KU, while non-LHC experiments at lower energies are primarily located at AU. DTU contributes to non-accelerator experiments and detector development. The University of Aalborg – AAU contributes to the LHC-GRID computing and SDU operates a High-Performance-Computing centre used for theoretical modelling.

2.3.3 Governance

NICE is located at KU and a centre director appointed by the NICE board leads the operations of the centre.

The NICE Board consists of the group leaders of all approved experiments at CERN with Danish participation. The board decides on the budget and allocates funds to the various groups.

2.3.4 Activities

NICE covers the mandatory membership fees for the approved experiments with Danish participation – typically called the Maintenance and Operations (M&O) fees. The fees are annually calculated based on participating researchers with PhD degrees.

NICE funds travel costs for Danish researchers to CERN. Researchers who participate in experiments are obliged to contribute in data taking on a 24/7 shift basis, which requires presence at CERN the whole year. To further cover these technical obligations, NICE is currently funding four Postdoc positions at the two LHC experiments ALICE and ATLAS, and is currently seeking further funding in support of Postdocs to support the experiments also with participation from Aarhus University.

A small part of the NICE budget is spent on running costs including small equipment, subscriptions for software and phones, contributions to various consortia, e.g. NUPECC and IPOCC, maintenance of the Danish car pool at CERN, summer students, rent of central pool electronics, etc.

It should be noted that CERN works with a time line and commitment of approx. 20 years and that NICE works to coordinate the scientific engagement derived from the national research funding on shorter to mid-term time scales, typically 1-5 years, against the long-term developments at CERN. In this, the Danish research community has strategically decided to only cover some of the CERN experiments, and therefore the Danish engagement in the experiments are deeply rooted in the scientific community with important contributions or even participation as founding members.

If Danish researchers would like to join existing experiments not yet covered by NICE or to join new experiments, NICE will try to support it but the process is very complex. For existing experiments, a new institute must be approved by the institute board of the experimental collaboration (one requirement is that it should bring something new to the collaboration) and it must pay M&O for its members with PhD degrees. For new experiments, the various CERN scientific committees must first approve them. If there is concrete Danish interest, NICE will strive to support it after a national strategic discussion and evaluation of the available funding envelope. If on the other hand individual researchers would like to become part of existing experiments covered by NICE, they can join under the umbrella of one of the already accepted Danish groups.

2.4 The fusion research community

2.4.1 Background

No research-supporting centre currently exists for the Danish fusion research though Danish researchers have access to a number of fusion research facilities. While ITER stands as the novel vast investment in fusion technology and will become an important research facility in the future, Danish researchers already have access to many other facilities in Europe: JET, TCV, ASDEX Upgrade, MAST Upgrade, Wendelstein 7-X, as well as the international experiments: JT-60SA, KSTAR, EAST and DIII-D.

Access to ITER and F4E is granted through the Danish EURATOM membership and the EUROfusion programme (approx. 200 million EUR annual budget) which is an EU Commission funded science programme with the aim to realise fusion and to organise access to a number of European and international fusion research infrastructures including ITER and F4E.

2.4.2 Relevant research community

Presently, research activities directly related to fusion are limited to DTU, specifically the plasma physics group at DTU FYSIK and DTU MEK. This currently involves approx. 25 people.

The DTU Risø IT department has been selected to host the JET data centre after BREXIT. This will happen during 2020. With the data centre it is likely that one of the Advanced Computational Hubs, that EUROfusion currently plans to establish, will be hosted at DTU. This would give DTU a significantly increased budget and roughly 10 additional positions.

2.4.3 Governance

Given the large number of topics related to fusion research, and the Danish expertise in many of these areas, the Danish fusion research community finds it important to involve other players than DTU in the field.

Access to the EUROfusion programme and funding takes place through the national Beneficiary of EUROfusion, which is DTU. However, other research centres and universities could be attached as so-called linked third parties and thereby be given access opportunities. At present, a process to have other universities on board and enable them to apply for European funding is under way for SDU and AAU. SDU has an interest to enter research activities for fusion in the fields of robotics, artificial intelligence, and diagnostics development and AAU is interested in electrical engineering for fusion.

The proposed governance of a centre for research-supporting activities for fusion research would therefore focus on enabling more Danish universities to gain access to the fusion research facilities and research programme via EUROfusion.

2.4.4 Activities

If a centre for research-supporting activities is created, it could increase awareness of the possibilities for access to fusion research facilities and attract additional EUROfusion funding to Danish universities.

The expectation is also that a centre could increase the possibility for Danish universities to get involved in F4E or ITER industrial contracts. This could be an opportunity for the education of students, PhDs and engineers.

2.5 The EMBL research community

2.5.1 Background

Besides two annual meetings at EMBL where DAFSHE and the Danish scientific delegate to EMBL participates, there has not previously been much interaction between DAFSHE and the Danish EMBL research community. While there is not currently a research-supporting centre in relation to EMBL, the Danish molecular biologists see an unharvested potential at EMBL that could benefit from such a centre.

Danish researchers have access to EMBL via:

- Employment at EMBL in one of several categories (staff, Postdoc, PhD, trainee/masters' students, etc.), and subsequently as EMBL alumni.
- The use of research infrastructures and core facilities including access to EBI databases and resources.
- Training via PhD and Postdoc programs as well as the courses and meetings programs that EMBL offers.
- Via the EMBLEM technology transfer and the industry programme, including as industrial suppliers to EMBL.
- Partnership interactions e.g. in science evaluation, joint strategies and collaborations.
- Research interactions (common grants and publications).

There is support from DANSCATT to the use of beam lines at ESRF and DESY for structural biologists.

2.5.2 Relevant research community

Although the Danish molecular biology community is large and active, there is currently no clear overview of the size and organisation of the Danish EMBL user groups. Thus, DAFSHE and representatives of the EMBL research community are currently taking steps to map the EMBL user landscape in Denmark.

A part of the Danish structural biology community is very visible and well-defined EMBL user group with well-documented use of synchrotron beamlines at both Hamburg (European XFEL, DESY/PETRA III) and Grenoble (ESRF). It is assumed that all Danish universities (in particular AU, KU and DTU) as well as Danish industry take part in this use, although the available user data does not readily decompose into individual institutions. The support for travel to the facilities and use of beamlines is supported in part from DANSCATT, which adds to the low-barrier use of the infrastructures.

At the same time, Danish researchers do not take advantage of many of the opportunities that EMBL mostly encourage for knowledge dissemination. Specifically, the Danish use of EMBL is very limited when it comes to the core facilities, courses and training stipends for junior researchers.

The Danish Research Institute of Translational Neuroscience – DANDRITE is an example of a well-known and visible user of EMBL. The research institute uses the organisational, strategic and operational business model from EMBL for recruitment and implements EMBL's core values of non-tenured group leader-based research in Denmark.

In addition, Denmark hosts many EMBL alumni (currently 64 of which 35 are Danes). The alumni have received training in research excellence and leadership from their employment at EMBL, and they bring back skills and competence to Denmark, as well as an extensive EMBL network relevant to recruitment and research collaborations. The almost 30 international EMBL alumni in Denmark add to the internationalisation of Danish research and provide a "brain-gain" for Denmark.

Access counts show that >50.000 unique IP addresses in Denmark access EMBL-EBI's molecular data resources yearly. Who these users are, which research fields they represent, how the use of EBI impacts their research, the fraction of industry users and its impact on business development, is, however, inaccessible from current reports and analyses, but the effect is expected to be critical.

2.5.3 Governance

EMBL represents many different possibilities, particularly for training of new researchers. A potential research-supporting centre for EMBL could facilitate the dissemination of these possibilities and the centre would thus primarily be a coordinating unit. This requires participation of representatives from the relevant universities and possibly also from industry and interaction at regular intervals.

2.5.4 Activities

One of the focus areas of a potential centre could be to increase the awareness of the opportunities at EMBL – particularly the opportunities that Danish researchers are currently not taking advantage of – and to disseminate the information broadly in the Danish research communities relevant to EMBL.

3. Review method and the review panel

The review method of the centres as described in this section, takes into particular consideration the purpose, history and individualities of the centres.

3.1 Methodology

The review was requested by DAFSHE, following three years of the current model for research-supporting activities (see section 1).

DAFSHE has a double role in relation to the centres and the involved research communities: On the one hand, DAFSHE has a close dialogue with the national research communities via the research-supporting centres in order to prioritize DAFSHE's engagement in the international research infrastructures to benefit the most from the memberships. On the other hand, DAFSHE decides on funding and has administrative oversight of the research-supporting centres, and must therefore maintain a certain arm's length to the actual organisation and operations of the centres.

It was therefore essential that the review was conducted by external reviewers with independence from the Danish research community. An external review additionally benefits from being able to provide a broader international perspective.

3.2 The review panel

To meet the requirement of an external and independent review, an international review panel was established, consisting of six members that are all prominent researchers. Five of the members each cover one of the research topics being the subject of the review (material sciences, high-energy physics, astrophysics, fusion research and molecular biology). The chair of the panel constituted its sixth member. The panel members were expected to be able to read and understand the Danish written language.

As part of the assignment, the panel was equipped with a "Terms of Reference" document prepared by DAFSHE, describing the expectations to the review and to the panel.

The purpose of the review was to asses:

1. Whether the model for the research-supporting centres is effective.
2. Which difference the centres make to the Danish memberships of large international research infrastructures, and whether or not there is a need for additional national centres in relation to the memberships of EMBL and F4E/ITER.
3. Whether the existing centres contribute to maximize the use of the Danish memberships, and whether new centres are likely to maximize the use of the memberships of EMBL and ITER/F4E.
4. Whether it would be useful to the model if the centres monitor their performance via KPIs and how this could be achieved in praxis.

3.3 The panel's work

The panel was first presented with background documents (in Danish) from each of the existing centres. The panel then met in a video meeting to discuss the outline of material to be used as the background for the review. On this basis, a number of generic questions were identified and each centre and potential centre was asked to write a report (in English) answering each of the questions.

The panel met again in a video meeting to discuss the written reports from each centre or relevant research community and discussed any final topics for clarification or elaboration that the centres should prepare. The main activity of the review was a face-to-face meeting with the researchers and the panel in Copenhagen on 18-19 February 2020.

The panel meeting in Copenhagen included interviews with representatives from each centre or relevant research community and the interviews were based on the written reports and any additional written material supplied by the centres/potential centres. Each centre or relevant research community was invited to attend the interview with up to three participants.

The interviews each lasted one hour, initiated by a short opening by the attending representatives. After the opening, the panel went into detailed and specific dialogue with the representatives in order to understand the relevant research community and the interaction with the international research infrastructures. After each interview, the panel convened for thirty minutes to summarise the interview. In the conclusion of the two days, the panel discussed and drew up their conclusions and recommendations for the whole panel meeting.

DAFSHE acted as secretariat for the panel, including for the preparation of the panel sessions and the drafting of the report. Representatives from DAFSHE were thus also present as observers and secretariat during the full interview session, under the understanding that the panel could request discussion in a closed session.

4. The panel's general observations

The written material and the interviews with the centres and relevant research communities gave the panel substantial insight into the workings of the model for the research supporting activities. The insights allow the panel to draw a number of general observations.

The model for the research supporting centres is working very well, and both the existing centres and the ministry should be very pleased with its successes, as it provides significant value for relatively modest funding.

The outcomes of the model are multiple:

- The centres organise the research communities nationally and establish a focus towards the international memberships of research infrastructures. Building a coherent national research community is essential for the engagement in the international infrastructures.

- Defining the research activities resides with the individual researcher and research groups, under the general mechanisms of international peer review. Thus, the centres do not take a supervising or deciding role on the individual research activities, but seeks to coordinate and summarise the common national research interests from the sum of the individual researchers.

- The centres enable a direct dialogue between the ministry and the research communities on strategic matters of national interest, including on the governance of the research infrastructures.

- It was not possible for the panel to identify elements of the model not working well or opposite to the intentions.

The research supporting centres are in these aspects unique in a Nordic and international context.

However, some elements identified call for further considerations:

- Some of the research-supporting centres develop national strategies for the relevant research fields and/or linked memberships of international research infrastructures. In contrast these same centres do not all seem to have clearly articulated long-term work plans.

- The existing centres operate in very different ways even though their purpose is the same: to support Danish researchers' access to, and efficient use of, the international RIs. Yet, the centres are surprisingly homogenous in their support of

building the community and supporting travels. The differences in ways of working are due to differences in the operations of the research infrastructures. This affects the culture of the communities, as well as the centres having different historical paths since their origins. While access to the infrastructures are outside the control of the centres and Denmark, the centres appear to have settled into modi operandi that works for their specific context. The panel discussed the possibility to encourage even more harmonisation between how the centres work, but concluded that this could create a risk for damaging the centres, which are already working very well today.

- The budgets for the existing centres are tight and there is no air in the budgets to allow for new activities. As the budgets are already limited for the existing centres, funding two new centres from the same limited budget envelope will harm the good results of the existing centres. At the same time, there is a great potential for optimising the use of the Danish investments in EMBL and F4E/ITER/ EUROfusion by establishing two new centres in relation to these.

- The existing centres all seem to have a good and direct dialogue with DAFSHE and this seems to be a mutual advantage to DAFSHE as well as to the centres and research communities. The dialogue seems to encourage the centres and research communities to organise themselves and use the centres as forums for strategic considerations, while it also helps DAFSHE in the official work in the governing bodies of the international RIs.

- Establishing new centres for EMBL and F4E/ITER/ EUROfusion also has great potential in organising the research communities and enabling more direct dialogue between the ministry and the research communities on strategic matters in relation to the memberships. Thus, there is a strong argument for initiating the new centres.

5. The panel's general recommendations

5.1 The model for research-supporting activities

The model seems to work as intended, efficiently and very well. Therefore, the panel recommends that, overall, DAFSHE should continue to fund research-supporting activities based on the current model, and should continue to allow some level of differences between how the centres are organised and their activities as additional harmonisation between the centres could put into risk damaging what currently seems to work well.

The panel recommends that DAFSHE encourage additional work on the opportunities for establishing two new centres: one centre for molecular biology/EMBL and one centre for fusion research including ITER/F4E. However, the panel does not recommend that funding for these new centres will be taken from the existing centres since that will harm the good results of the existing centres, and the panel notes that more investigation into the exact needs of the user communities should be done before new centres can be established.

The panel recommends that the perspectives of the centres is altered to address a longer period, and that they each formulate five-year work plans. These plans can form the base for the centres to work more focused with their activities in order to achieve their individual goals and the longer timeline better matches the even longer timelines of the accessed research infrastructures. At the same time, the panel recommends that DAFSHE funds the centres based on these five-year plans to give the centres stable funding over longer terms, with a clearer strategic framework. The centres should continue to submit annual reports as today.

The panel recommends that the centres are reviewed in-depth every three to five years. The first mid-term review should then be three years after the launch of the first five-year plans. This would give the centres the possibility to adjust for the next five-year period.

The panel finds that the present method for the review, with an interview-based approach, works very efficiently, with the panel having the right size and scientific insights, fostering good discussions in the panel and with the relevant research communities during the interviews.

The mid-term review could be structured with the same methodology, with written material and interviews with the centres and participation by DAFSHE. However, the focus should be on the outcome of the centres' activities and an elaboration of their added value, rather than on how the centres function. The panel notes that the mid-term review could benefit from a clearer and more structured framework for the written mate-

rial and interviews, in order to homogenise the input from the centres, as well as allowing the centres more time for their structured oral presentations (i.e. without slides) at the opening of the interviews.

Further, the composition of the panel should be gender-balanced.

There is potential in ensuring that all the centres formulate actual strategies for Danish use of the international research infrastructures and/or for the development in the relevant Danish scientific communities. The centres that have not yet done so should be requested to develop such strategies. In areas where international strategies already exist (e.g. the European Particle Physics Strategy for CERN-related activities), the centres could formulate sub-strategies on how to nationally respond to the international strategies. The panel encourages DAFSHE and the centres to explore this possibility more.

With an outset in the national strategies, a natural framework becomes available for developing the activities and individual KPI's for each centre.

5.2 The centres' activities and KPIs

The panel recommends overall that the existing centres continue their current activities, as they provide significant value at large. However, the centres should create more awareness about their accomplishments for Danish research, notably in terms of community building.

At the same time, Denmark does not seem to take full advantage of education and training opportunities at the international research infrastructures, and the panel encourages the centres to focus on disseminating these opportunities to the relevant communities.

The panel recommends DAFSHE to have regular contact with the centres especially in preparation for the council meetings of the relevant international research organizations, e.g. by scheduling the centres' board meetings close to the council meetings.

The panel recommends that in the yearly work plan each centre sets some Key Performance Indicators (KPIs) that should reflect the centres' long-term work plans and, if relevant, their national strategies. Thus, the KPIs can be different for each centre. The KPIs should be clear and consistent and be set from a base-year and measured from that year on. Each centre should include some KPI's that can be measured quantitatively over time as well as some more qualitative measures.

KPIs such as the size of the relevant research communities and amount of experimental time or number of travels/visits to the international research infrastructures are relevant to all centres, though the unit of measurement may vary between the centres.

5.3 Funding of the centres

As mentioned above, the panel recommends that the funding of the centres should be stable beyond the current one-year perspective, in order to allow defining clearer strategic goals. Therefore, decisions on the funding framework for each centre, based on

open competition between the centres as today, should be made every three to five years, even if the grants given to the centres are annual.

The panel recommends that DAFSHE should not reduce the funding provided to the existing three centres and, hence, the panel recommends that funding for two new centres should not be taken from the current budget envelope for the existing centres. Cutting the funding for the existing centres could potentially damage the proven successful track-record of these centres.

Instead, the panel recommends DAFSHE/the Ministry to seek an optimised and balanced Danish return from the existing investments in international research infrastructures. This could be achieved by a modest adjustment in the investments in new national research infrastructures (managed via the national roadmap catalogue process). This could be in the scale of 1 million DKK from the roadmap process, in order to establish the two new centres for EMBL and the fusion community (see below). Funding to all the centres should still be from a closed budget envelope for specific, named centres. As more investigation is needed before actually establishing the two new centres, smaller funds (e.g. a size of 200.000 DKK) might be enough for the initial work.

The panel recommends that DAFSHE should not establish formal requirements on co-funding from the Danish universities as a solution to increase the total budget envelope. There is already a great amount of co-funding to the existing centres, by the working hours put into the centres by the people engaged. The time invested by mere engagement underlines the high value that the universities and research communities see in the centres.

6. Recommendations to specific centres and research communities

6.1 DANSCATT

DANSCATT is working very well and has managed to involve a very large user base across many disciplines. Furthermore, DANSCATT still expects the number of users to increase over the coming years as new beam lines become available. DANSCATT is very successful in proactively reaching out to user groups at the Danish universities.

It stands clear that DANSCATT is managed by its board in terms of very engaged people. The success of DANSCATT is closely tied to the prevalent excellence of these key people and that should not be underestimated. However, the panel received the impression that the managing of DANSCATT is an organically driven process. This is a risk for the long-term sustainability of DANSCATT.

The panel therefore recommends that DANSCATT develop a clear plan for their operational approach, working towards an established structure for DANSCATT. This would simultaneously aid DANSCATT in articulating how and what DANSCATT should achieve and assist in reaching out for new user communities. This should be seen in supplement to (or as the overarching framework for) the scientific strategy for DANSCATT that is already a well-established instrument.

DANSCATT expresses an interest in developing national summer schools. The panel considers it not unrealistic to find external funding for this, or e.g. find the funds within the centre's own means by reducing the amount of funding for travel slightly.

DANSCATT has the possibility to consider a variety of KPIs, e.g. the number of PhD students and master students, access to beam time, the number of publications etc.

6.2 IDA

IDA is progressing well in building the community and in developing strategic priorities. Even though the annual IDA budget request exceeds what is funded, IDA has very clear priorities of its activities, standing out from the other centres.

The panel recommends that IDA focus more on disseminating the opportunities of ESO Fellowships, as this is important for the long-term evolution of the community in Denmark. The panel also recommends that IDA continue it's work in formulating a coordinated strategy for Danish astronomy and astrophysics.

Exciting possibilities are as well present in IDA's continued efforts in coordinating ground-based and space-based astronomy. Next to its existing summer school for ground-based observations, IDA should continue its effort to create a summer school for space-based observations, thereby taking advantage to integrate DTU Space and space activities at other Danish universities.

IDA is very well in position to define suitable KPIs, e.g. the amount of Danish observing time at ESO and the output of master and PhD students.

6.3 NICE

NICE provides substantial value to the Danish CERN community, by addressing the many different activities of logistical and operational nature, which is a prerequisite for Danish researchers being able to participate in the experiments at CERN. The panel recommends that NICE should continue their scope of activities in general.

The panel encourages NICE to focus on taking advantage of the PhD opportunities at CERN.

KPIs for NICE could include the number of PhD students and master students engaged with CERN, and e.g. the number of publications.

6.4 Molecular biology/EMBL

The panel recommends that DANSCATT should continue to support the access for molecular biologists to synchrotron beamlines, as the competencies for this access support are well anchored within DANSCATT.

The panel recommends DAFSHE to establish an EMBL committee with the following two tasks:

1. To engage in a dialogue with the ministry and – together with the molecular biology community – to investigate if there is an elaborated need for a strategy for the EMBL community and for an actual research-supporting centre. If so, the EMBL community should propose this to DAFSHE.

2. To find channels for disseminating the EMBL opportunities such as the EMBL training and temporary employment opportunities, which are integrated part of the EMBL infrastructure. This seems to be one of the primary potentials of a centre in relation to increased value for molecular biology and Danish engagement in EMBL.

6.5 Fusion research - F4E/ITER

The Danish fusion community is small but growing and has thoughts on how to organise themselves. There is a clear view and plan for involving research groups outside plasma physics, and across the Danish universities.

The panel appreciates that there already is a collective approach considering utilising the Danish engagement in EUROFusion, which lies beyond an isolated focus on ITER: EUROfusion is important to open the Danish engagement in ITER, with inspiration found in the effects of the existing research supporting centres.

The panel sees a clear benefit from a centre in order for Denmark to take more advantage of the opportunities in EUROfusion, including in the future from F4E/ITER, and for Danish universities other than DTU to become engaged within the EUROfusion programme. The panel therefore recommends that DAFSHE ask the Danish fusion community to engage in the start-up of a new centre. Initially, funding should address the administrative part of the centre, whereas later more funding might be needed.

The panel also finds that the establishment of a centre for fusion is somewhat urgent, due to the current prolific dynamics of the fusion community, which may constitute a window of opportunity.

The general recommendations above on a 5-year work plan and the development of national strategy, with KPIs, carry over unchanged to the fusion community.

7. List of most-used acronyms

Acronym	Full name
AU	Aarhus University
AAU	Aalborg University
CERN	The European Organisation for Nuclear Research
DAFSHE	The Danish Agency for Science and Higher Education
DANSCATT	Danish Instrument Center for the use of X-ray, synchrotron and neutron sources
DTU	Danish Technical University
EMBL	The European Molecular Biology Laboratory
ESA	The European Space Agency
ESO	The European Southern Observatory
ESS	The European Spallation Source
ESRF	The European Synchrotron Radiation Facility
European XFEL	The European X-Ray Free-Electron Laser Facility
F4E	Fusion for Energy
IDA	Danish Instrument Center for Astrophysics
ILL	The Institut Laue-Langevin
ITER	The International Thermonuclear Experimental Reactor
KU	University of Copenhagen
NICE	National Instrument Center for CERN Experiments
SDU	University of Southern Denmark

8. Appendices

The following appendices are included:

- The Terms of Reference for the international review panel
- The programme for the panel meeting in Copenhagen on 18-19 February 2020

Ministry of Higher Education and Science Denmark

Panel review of the national centres for research-supporting activities for research infrastructures – Terms of Reference (DRAFT)

1. Background

In 2016, a review was conducted of the three national centres that supports the Danish memberships of international research infrastructures, as funded by the Danish Ministry of Higher Education and Science:

Center	International membership(s)	Research area	Host university	Home Page
DANSCATT	ESRF, ESS, European XFEL, ILL	Material sciences	DTU	http://www.danscatt.dk/
IDA	ESO, NOT, ESA	Astrophysics	AU	http://phys.au.dk/ida/
NICE	CERN	High-energy physics and more	KU	https://nice.ku.dk/

The centres have as their main purpose to facilitate access for Danish users (primarily researchers) to the international research infrastructures. The term "access" is to be understood broadly and relative to the different modalities of the infrastructures. The centres can e.g. cover travel costs for researchers to peer reviewed allocation of experimental time at the facilities, or they can cover the costs of technical post docs fulfilling part of a mandatory operational duty cycle implied by the Danish membership. On the other hand, the centres cannot fund the actual research performed at the research infrastructures, with the funding that the centres receive from the ministry.

The centres are national, and, on behalf of the relevant universities, they coordinate the Danish scientific interests towards the research infrastructures, e.g. via national annual meetings. Further, the centres serve as advisors to the Danish Ministry for Higher Education and Science, particularly in terms of maximizing the impact of the Danish access to the facilities.

The outcome of the 2016 review was that from 2017 the centres were brought under the same framework of purpose, activities and organisational model, as well as under the same national envelope on the national budget. Based on a three-year activity plan, the centres submit proposals for funding every year, and the directors of the Danish Agency for Science and Higher Education (DAFSHE) decides on the distribution of the funding between the centres from the common funding envelope.

The 2016 model also introduced the requirement that 65% of the funding of a centre must be used for access-driven activities. The remaining 35% can be more freely spent on activities within the purpose of the centres and within the centres' approved activity plans – thus allowing the centres some freedom with respect to the differences among the different research infrastructures and traditions in the research areas.

2 September 2019

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In addition to the 2016 review, the context of the three centres was reviewed in 2017-2018 as part of a major impact assessment of the Danish memberships of international research infrastructures. One conclusion from the assessment was that the centres are crucial for the impact of the Danish memberships. It was simultaneously noted that neither EMBL nor F4E/ITER have associated centres, and the need thereof should be assessed.

2. Purpose of this review

After the elapse of three years under the new structure of the centres, DAFSHE finds it timely to conduct a check of the model created for the existing centres. The panel is kindly requested to consider the following aspects:

1. Whether the model for the funding, organisation and (limitations on) activities of the research-supporting centres is working effectively and as intended or whether it should be adjusted. To this aspect, the existing centres' assessment of the model and potential difficulties with it would be very relevant.

2. Which difference the centres make to the Danish memberships of the relevant international research infrastructures and which difference potential new centres could make in relation to EMBL and ITER/F4E and in regard to the latter, whether or not there is a need for additional national centres in relation to the memberships of EMBL and F4E/ITER.

3. Whether the current activities of the existing centres and/or plans for future activities contribute to maximize the use of the Danish memberships or if they should be adjusted. For potential new centres: whether their proposed activities are likely to contribute to maximize the use of the memberships of EMBL and ITER/F4E.

4. Whether it would be useful to the model if the centres monitor their performance via KPIs and how this could be achieved in praxis.

The panel is welcome to give recommendations at large, within or in addition to the above-mentioned aspects and ideally, the panel recommendations will link to the recommendations from the impact assessment of the Danish memberships of international research infrastructures. The panel can e.g.:

a) Conclude on the dialogue with the centres, providing recommendations e.g. on the activities of the centres, prioritizations etc.

b) Include recommendations about DAFSHE's work with the centres.

c) Include recommendations on the future dialogue with the centres on the utilization of the memberships, e.g. via KPI's.

The financial framework of the review is such that no additional funding from the Agency can be expected outside the current frame allocation at the national budget (2019: 13.2 MDKK). The panel could, however, consider the prioritisation of the funding of existing and potential new centres within the currently fixed budget envelope. In addition to the latter point, DAFSHE plans to engage in a dia-

logue with the Danish universities via the National Committee for Research Infrastructure (NUFI) about whether there might be a possibility to introduce requirements for co-funding from the universities either in-kind (e.g. FTEs, travels, material costs) or cash e.g. from the involved universities.

3. The review panel

With the review containing assessments of the dynamics between the Agency and the centres, with the basis in the international research infrastructures, an international review panel will be established, led by a panel chair.

The panel is composed to have scientific experience from the various research areas, and insight into the engagement with the relevant international research infrastructures. The panel is envisioned to assess all of the above mentioned aspects of the Danish model and centres for research-supporting activities.

The review panel is composed of the following members:

Name	Affiliation	Role and scientific area
Professor Aleksandar Matic	Department of Physics, Chalmers University of Technology	Chair, Material Sciences
Dr. Oliver Bunk	Head of the Laboratory for Macromolecules and Bioimaging (LSB), Paul Sherrer Institute	Member, Material Sciences
Professor Per Lilje	Institute of Theoretical Astrophysics, University of Oslo	Member, Astrophysics
Professor Torsten Åkesson	Division for Particle Physics, Lund University	Member, High Energy Physics
Professor Eirikur Steingrimsson	Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Iceland	Member, Molecular Biology
Professor Pär Strand	Director of Chalmers e-Science Centre, Department of Space Earth and Environment, Astronomy and Plasma Physics, Plasma Physics and Fusion Energy	Member, Fusion Energy

The panel members are each appointed in their personal capacity and as experts within the scientific areas listed above. Hence, the panel members are not appointed as representatives of their institutional affiliation or the like. The panel should feel free to give their assessment and recommendations in any direction, including recommendations about DAFSHE's work.

The Chair, Aleksandar Matic, is expected to lead the interviews with the centre representatives and to ensure that the different aspects of the assessment are covered in each interview. All members of the panel – especially but not limited to the member from the relevant scientific area – are however encouraged to participate in the interview with the centre representatives. All panel members are expected to participate in the discussion of the overall assessment and recommendations.

DAFSHE will act as secretariat for the panel and will draft the panel conclusions for the panel to approve. If the panel wishes to, the panel is welcome to have part of the discussions without DAFSHE's attendance – this could be relevant if the panel wishes to discuss recommendations towards DAFSHE.

As many of the background documents for the review are only available in Danish, all panellists should be able to read Danish at a sufficient level. The review itself (including interviews and written conclusions) will, however, be conducted in English.

4. Process and timeline

The main activity of the panel is a two-day face-to-face meeting (from lunch on day 1 to around 3pm on day 2) in Copenhagen, Denmark, during which the panel will interview stakeholders in relation to the existing and possible new centres. For the existing centres these will be the heads of the centres (plus one extra representative at their choosing) and for potential new centres, these will be representatives of the F4E/ITER and EMBL community. The face-to-face meeting will end with time for the panel to discuss their final assessment and recommendations.

It is additionally expected that the panel will be invited by the chair of the panel to some shorter meetings via video conference to prepare and conclude the panel work. If the panel wishes to, DAFSHE can participate in these meetings as well.

The Agency will prepare a summary report of the panel's assessments and recommendations for approval by the panel. The approved report will be presented to the Danish National Committee for Research Infrastructure[1] in spring 2020.

Time	Activity
September/October 2019	Short video conference in the panel about which written material the centres/potential centres should be asked to produce for the review. DAFSHE will ask the centres/potential centres to produce the written material
December 2019	The panel receives the written material from the centres/potential centres
January 2020	Short video conference in the panel about which questions they should ask the centres/potential centres for the interview. DAFSHE will write an interview guide for the panel based on their discussion.
18-19 February 2020	Panel face-to-face meeting in Copenhagen. DAFSHE will produce a written report about the panel recommendations
March 2020	Short video conference in the panel to approve the written report about the panel recommendations
Spring 2020	Presentation of report to the National Committee for Research Infrastructures (NUFI) and other relevant stakeholders, e.g. relevant user communities

A draft program for the face-to-face meeting is as follows:

Day	Time	Action
1	12:00	Welcome by DAFSHE and Chair
1	13:00	First interview
1	14:00	Break and follow-up from first interview
1	14:30	Second interview
1	15:30	Break and follow-up from second interview

[1] The Committee is composed of representatives from the Danish universities and the Independent Research Fund Denmark, with the Danish National Research Foundation as an observer.

Day	Time	Action
1	12:00	Welcome by DAFSHE and Chair
1	16:00	Third interview
1	17:00	Follow-up from third interview and end of interviews day 1
1	19:00	Dinner
2	9:00	Fourth interview
2	10:00	Break and follow-up from fourth interview
2	10:30	Fifth interview
2	11:30	Break and follow-up from fifth interview
2	12:00	Lunch
2	13:00	Discussion of final assessment and recommendations
2	15:00	End of day 2

Danish Agency for Science and Higher Education

Ministry of Higher Education and Science Denmark

Programme - Interviews for the review of the Danish research-supporting activities for research infrastructures

Dates: Tuesday-Wednesday 18th-19th February 2020
Time: 12:00 at Day 1 to 15:00 at Day 2
Place: Hotel Park Inn, Engvej 171, 2300 Copenhagen, Denmark
(metro: Femøren)

Presence of representatives from the research communities is expected only at the indicated times.

17 December 2019

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Programme Day 1: 18th February

Time	Action
12:00	*Panel opening*
13:00	**First interview – NICE**
14:00	*Follow-up from first interview*
14:30	*Break*
14:45	**Second interview – ITER/F4E**
15:45	*Follow-up from second interview*
16:15	*Break*
16:30	**Third interview - IDA**
17:30	*Follow-up from third interview*
19:30	*Panel dinner*

Programme Day 2: 19th February 2020

Time	Action
9:00	**Fourth interview - DANSCATT**
10:00	*Follow-up from fourth interview*
10:30	*Break*
10:45	**Fifth interview - EMBL**
11:45	*Follow-up from fifth interview*
12:15	*Lunch*
13:00	*Discussion of final assessment and recommendations*
15:00	End of day 2