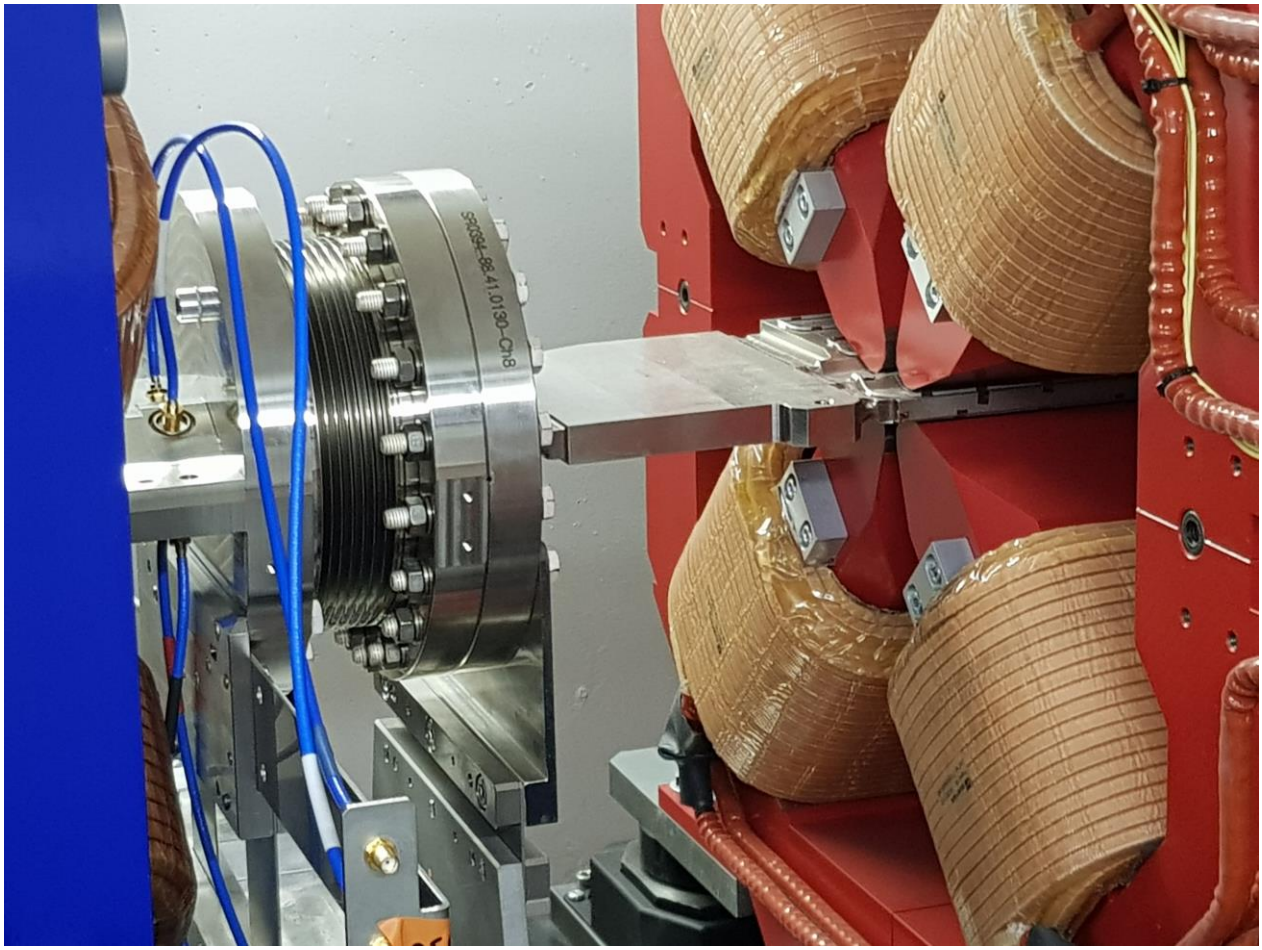
Nordsync Annual Report 2019



Content

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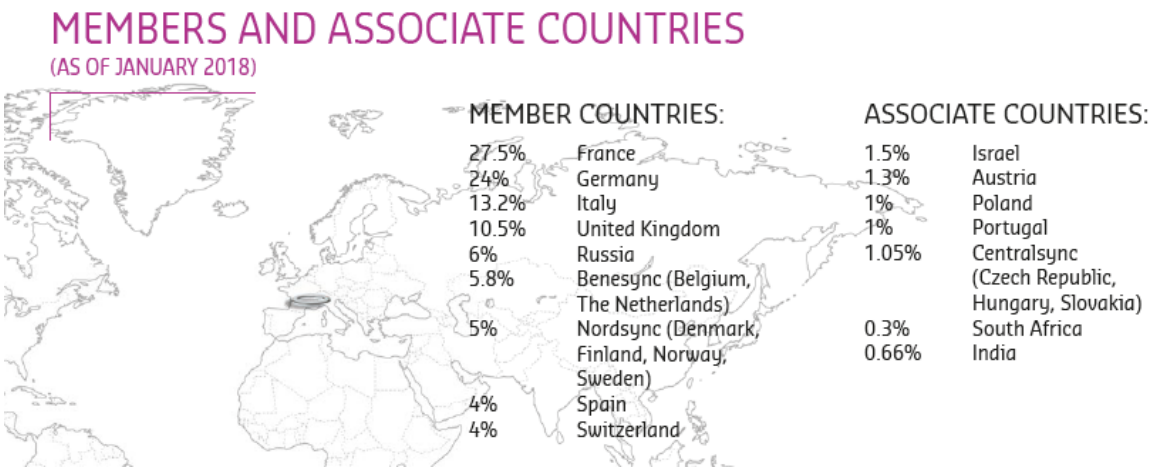
***Cover:** Quadrupole magnet at the ESRF produced by Danfysik, Denmark, photo: Prof. Helmer Fjellvåg, University of Oslo, Norway, Norwegian delegate of ESRF Council.*

Background

The four Nordic countries Denmark, Finland, Norway and Sweden are members of the ESRF through the consortium Nordsync, as formulated in the revised agreement concerning Nordsync that entered into force as from January 2008 and an amendment as signed in 2011. An up-dated agreement was worked out during 2019 and will go into force 2020 (full agreement in Appendix 1). The objective for Nordsync is to coordinate and enhance the use of synchrotron radiation generated by the ESRF and a cryo electron microscopy facility for scientific and industrial research in the Nordic countries, and to promote purchases to the ESRF from Nordic companies.

Since the agreement on the ESRF was signed by 12 member states in 1988, the number of countries joining ESRF as member or associate countries have grown continuously. The ESRF is supported by 13 member countries and 9 associate countries. The relative contributions from the ESRF member and associated countries are shown in Figure 1.

Figure 1. ESRF members and associated countries (since January 2018).



After 15 years of successful operation, the ESRF launched in 2009 an ambitious Upgrade Programme ESRF UP, which has been on the Roadmap of the European Strategy Forum Research Infrastructures (ESFRI) since its inception. The ESRF UP program has two phases. Phase I, which focused on the beamlines at a budget of 168 MEuro was completed in 2015. Phase II at an estimated cost of 156.6 M Euro (in 2019 prices) includes a 4th generation synchrotron source, the second after MAX IV, to become EBS (Extremely Brilliant Source), and four new flagship beam-lines.

The planning of the Phase II EBS-project was completed in September 2015, and the implementation schedule has not changed a single day since then! Phase II includes also four state of the art beamlines. One of these beamlines is the CDR2 – *Beamline for hard x-ray* in which the chair of Danscatt Henning Friis Poulsen, plays an instrumental role. The 20 months shutdown of the ESRF necessary for installation of the new magnetic lattice started December 10, 2018. The first electrons in the new EBS storage ring were injected November 28, 2019, commissioning of the new storage ring started on January 17, 2020, and the beamlines on March 2, 2020. On March 14, 2020, the technical specifications of the new EBS storage ring were met almost six months ahead of schedule. Due to the Corona pandemic all activities at the ESRF were shut down

March 16-May 11, 2020. In spite of this, user mode operation did start according to schedule on August 25, 2020, with 26 beamlines, but in remote mode as users were not allowed to come to the ESRF site due to the Corona pandemic.

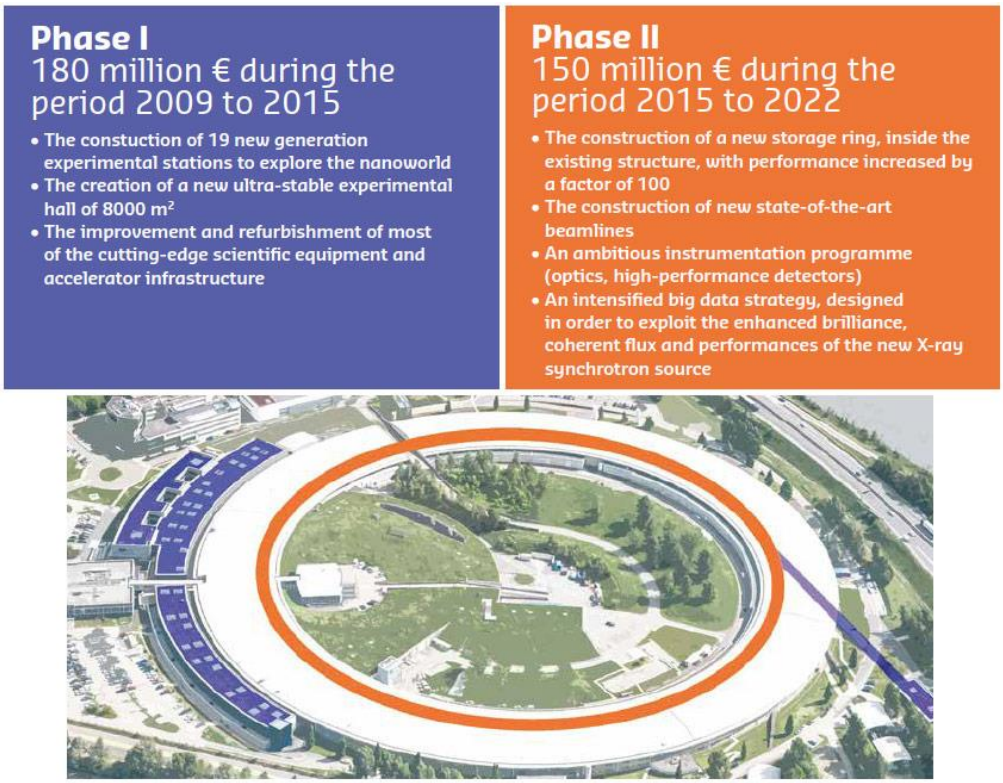


Figure 2. The ESRF Upgrade programme 2009–2022.

Activities at the ESRF in 2019

Cryo-electron microscopy is a powerful complementary technique to macromolecular crystallography. In 2015 it was decided that the structural biology beamlines at ESRF should be complemented by a cryo-EM facility. A Titan Krios cryo-electron microscope (cryo-EM) was installed in 2017, and is open to users since late 2017; the cryo-EM facility is described in detail in Kandiah *et al. Acta Crystallographica Section D* **2019**, *75*, 528-535. The cryo-EM facility is managed like a synchrotron beamline (CM01) which has been open to users during 2019 as it is independent of the up-grade installations. The beam-time statistics for CM01 March 2019-February 2020 are given in Appendix 2.

Progress of the up-grade phase II

The first storage ring at the ESRF started to produce synchrotron light in 1992. The life time of storage rings are ca. 20 years in spite continuous upgrades of components and maintenance. In 2012 the design of a new storage ring at the ESRF started to be one of the first fourth generation storage rings allowing production of smaller X-ray beams with a brilliance up to 1000 times better than the old facility. The planning of the exchange of the old storage was completed in September 2015, and the implementation schedules did not change a single day since then, an extraordinary achievement. Design and procurement took place in 2016-2017, and the production and delivery of all major components in 2017-2019. 328 large magnets to the storage ring were delivered by Danish company Danfysik, Figure 3. These magnets were

placed on girders, Figure 4, which were assembled and stored remotely October 2017-March 2019. Four girders make a cell, and the entire new EBS storage rings consists of 32 cells making up a total of 128 girders, with a total length of 844 m.
The old storage ring was dismantled and the ring tunnel was cleaned and painted December 13, 2018-March 2019. The installation of the 128 girders, making up the new EBS ring, took place April-October 2019. The ring tunnel was closed in early November 2019. The first electrons were injected into the new storage ring on November 28, 2019, and the commissioning started on December 2, 2019. The machine commissioning, by tuning all technical parameters, started on January 17, 2020, and the commissioning of the beam-lines started on March 2, 2020. All 27 beam-lines did find beam within fractions of millimeters from their old positions. On March 14, 2020, the EBS storage ring achieves the technical parameters targets almost six months ahead of schedule. Because of the Corona pandemic the entire ESRF was shut down March 16 - May 11, with only a handful of persons being allowed to be present at a time to perform safety related work. From May 12 the commissioning of the EBS storage ring and the beam-lines continued. On August 25, 2020, the ESRF did open up for users on 26 beam-lines according to the original plan, in spite of the Corona pandemic shut-down, an out-standing achievement.
The cost of the phase II up-grade is 156.6 MEuro, 3.0 MEuro over budget in 2019 years prices. There are missing funding of the EBS Phase II up-grade project of totally 10.5 MEuro.
The beam-line portfolio after Up-grade II is summarized in Appendix 3.

Figure 3. Hexapole (green) and Quadrupole (red) magnets to the new EBS storage ring at the ESRF (figure from https://www.danfysik.com/).

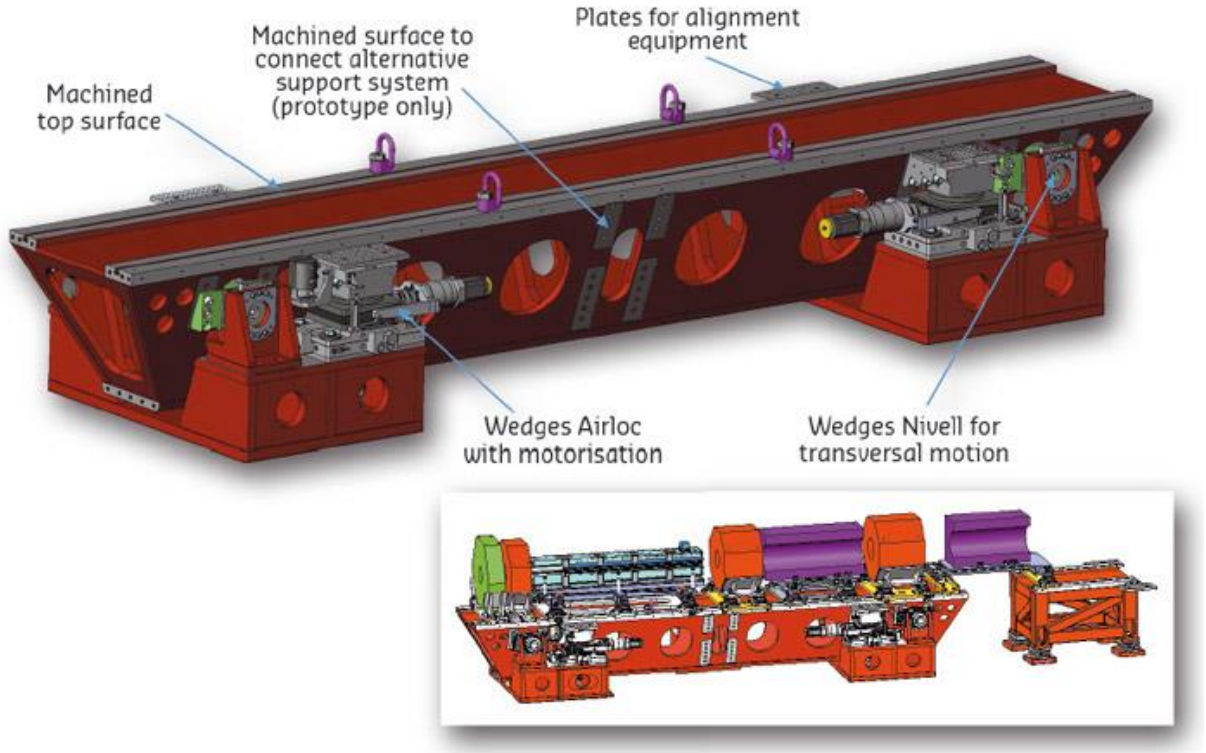


Figure 4. The ESRF-EBS girder (empty) and loaded with magnets (inset). The hexa- and quadrupoles have the same color as in Figure 3 (figure from http://www.esrf.eu/home/UsersAndScience/Publications/Highlights/highlights-2015/enabling-technologies/et08.html).

Statutes and transfer of shares

From November 2017, Russia became a member of the ESRF and has signed for 6 % of the ESRF Company's shares. The shares were transferred from the following shareholders:

- 1.0% from the Member designated by Germany (DESY)
- 1.5% from the Member designated by Italy (CNR and/or INFN)
- 3.5% from the Member designated by the UK (STFC)

Initiated by the redistribution of shares among the members and Nordsync's overuse of beam time, the Nordsync countries decided to increase their share of the ESRF from 4 to 5 %. This meant that 1 % of the ESRF Company's shares were formally transferred to the Danish Agency for Science and Higher Education (DAFSHE). DAFSHE is the formal signature for the Nordsync Consortium, thus receiving the shares of the ESRF Company. This additional 1 % share was obtained by transfers from the following shareholders:

- 0.5% from the Member designated by Germany (DESY)
- 0.3% from the Member(s) designated by Italy (CNR and/or INFN)
- 0.2% from the Member designated by BeNeSync (BELSPO)

Legal documents

The original text of the Convention was not as such modified following the accession of Russia. However, the ESRF included Russia to the original text, and have prepared an

amended text that takes into account both accessions. The legal texts will be the original Convention, the Protocol of Accession of the Netherlands in 1991 and the Protocol of Accession of Russia in 2014 and Statutes of the ESRF Company. The consolidated text of the Convention remains an internal document for ease of reference and use without any legal value.

Construction Cost Reference Value

Council approved the CCRV to be updated from EUR 228,673,500 to EUR 337,596,228. The new CCRV will be applied from 2023 onwards, and will be used for the calculation of the contribution to construction cost:

- By new partners joining after 2022,
- By existing partners increasing their share as of 2023,
- In the frame of the calculation of exceptional contribution due to scientific overuse of the facility after 2022.

The new CCRV will also be used in 2024 when calculating, if applicable, exceptional contributions due to scientific overuse of the ESRF in the period 2021-2023, to be paid in 2025.

Nordsync's financial contribution to ESRF

At its 70th ESRF Council meeting in November 26-27, 2018, the ESRF Council approved the budget for 2019. The financial state reported at the 73rd ESRF Council meeting in June 2020 showed a final out-turn of 110 225 kEUR including an overall balance of 4 449 kEUR for 2019. The Nordsync contribution to the ESRF budget for 2019 amounted to 6 057.05 kEUR. This contribution consists of three components: contributions to operation and the ESRF-EBS project, both based on the 5 % Nordsync share of the ESRF budget (4 774.50 kEUR), and the scientific overuse of beam time of Nordsync countries according to ESRF rules for corrective measures (the exceptional contribution, 1 283.00 kEUR). An overview of Nordsync's contributions to ESRF in the period 2014–2019 is presented in Table 1.

Table 1. Nordsync's contributions to ESRF`s income budget in 2014–2019.

ESRF income budget	2014	2015	2016	2017	2018	2019
Share Members contribution (EUR)*	3,589,870	4,517,250	4,565,600	4,611,250	4,680,450	4,774,050
Exceptional contribution overuse beam time – corrective measure (EUR)*	2,098,347	776,407	1,052,114	1,240,665	1,211,000	1,283,000
Reserve for increase in electricity costs (EUR)*				161,560		
Total contribution Nordsync (EUR)*	5,688,217	5,293,657	5,617,000	5,868,071	5,891,450	6,057,050
Nordsync use beam time (%)	6.99	6.29	6.01	6.75	6.79	N/A
Nordsync ideal share (%)	5.00	4.81	4.81	4.78	4.75	N/A

*Source: Calls for contribution 2014–2019

Corrective measures and effect on the distribution of beam time for Nordsync

Guidelines are in place to regulate the scientific use of the ESRF in relation to the number of shares. Ideally the amount of beam-time allocated for an ESRF member should match the shares the member has of the ESRF. In addition, each member and associated partner can add 10 % to their ideal share of beam-time. The use of beam time exceeding these 10 % is regarded as "overuse" and the member is requested to pay an exceptional contribution. Nordsync has received and used more beam-time than the ideal share for many years, Table 1, and has therefore paid exceptional contribution. Nordync is presently the only member paying exceptional contribution. The exceptional contribution is based on the average “overuse” the three previous years; the exceptional contribution for 2019 is based on the “overuse” in 2016-2018. For 2019 and 2020 no “overuse” is registered due to the up-grade II shut-down. The exceptional contribution for 2020 and 2021 will therefore be approximately 2/3 and 1/3 of the one in 2019, respectively.

Beam-time is granted through peer review, and though the number of Nordsync proposals submitted roughly corresponds to the 5 % of the shares, the proposals from the Nordic user communities are of such an excellent quality that based on the outcome of the peer reviews, Nordsync users should have more than 6 % of the beam time. As a consequence, Nordsync has annually paid exceptional contribution for overuse according to the rules for corrective measures. The implemented routine is as follows: *Allocation of beam time above **6.5 %** (calculated on an average of three years) needs approval from the four Nordsync members*. The scientific consequence of the present routine is that there can be limitations other than those introduced through the peer review process, in the beam time allocated to the Nordic users.

Organisation of Nordsync

Distribution of shares

The distribution of national shares between the four Nordsync countries is adjusted every third year based on their use of beam-time at the ESRF. This is measured by the DONE (8 hour) shifts at the ESRF beam-lines by the national users, in the preceding three years. This procedure is in accordance with the Nordsync agreement (2008). The annual shares for each country of the DONE shifts for Nordsync are given in Table 2. There was no beam time at the ESRF for users in 2019 and most of 2020 due to the installation and commissioning of the new EBS storage ring and consequently no overuse of shifts. The calculated distribution of shares for the periods (2014-16) and (2017-19) are presented in Table 3. For the next coming periods, the calculation of shares are regulated in the revised agreement (Appendix 1) and Appendix 4 gives a more detailed description of the calculation of the national shares.

When the ESRF is in normal operation scientists can apply twice a year (March and September) for beam time at all public beamlines, including CM01, and available CRG beamlines at the ESRF by submitting proposals that describes the expected scientific outcome and the experiment to be performed at ESRF beamline(s). In 2019 twelve proposal review panels reviewed the applications submitted for beam time at a specific group of beamlines, corresponding to different scientific areas.

Table 2. Annual distribution of the DONE shifts at ESRF between the Nordsync countries

Year	Annual percentage of the distribution of shifts				Data mining for distribution of shares (periods)			
	Denmark	Finland	Norway	Sweden	2014-2016	2017-2019	2020-2022	2023-2025
2009	19.8 %	13.2 %	24.1 %	43.0 %	X			
2010	28.5 %	8.2 %	16.3 %	47.0 %	X			
2011	25.7 %	9.7 %	22.7 %	42.0 %	X			
2012	22.8 %	11.6 %	28.9 %	36.7 %		X		
2013	22.3 %	20.0 %	24.0 %	33.7 %		X		
2014	22.6 %	15.6 %	23.9 %	37.9 %		X		
2015	22.2 %	15.8 %	20.8 %	41.3 %			X	
2016	28.3 %	12.9 %	16.4 %	42.4 %			X	
2017	27.8 %	8.5 %	22.0 %	41.6 %			X	
2018	19.59 %	14.55 %	16.17 %	49.70 %				X
2019*	23.96 %	13.01 %	21.53 %	41.50 %				X

*It has been agreed within Nordsync that during the up-grade II shut-down 2019 and 2020 a 10 years' average shall be used according to the updated Nordsync agreement.

Table 3. National shares of the Nordsync membership of ESRF (2014-2016), (2017-2019) and (2020-2022)

National shares	2014-2016	2017-2019	2020-2022
Denmark	24.66 %	22.57 %	26.10 %
Finland	10.35 %	15.73 %	12.40 %
Norway	21.03 %	25.60 %	19.70 %
Sweden	43.98 %	36.10 %	41.80 %
Subtotal	**100 %**	**100 %**	**100 %**

Nordsync's representation in Council and Administrative and Financial committee (AFC)

The Nordsync delegation is comprised of a representative from each of the four member's countries, which represent Nordsync in the ESRF Council as:

1. Member of Council and Head of Delegation (HoD)
2. Member of Council
3. Member of Council
4. Adviser in the Council and substitute for a member *and Vice Head of Delegation*

According to the decision of the Nordsync Annual Meeting 2013, the council assignments shall rotate every second year among the steering committee members following the order Sweden-Finland-Norway-Denmark, with the Swedish representative acting as Head of Delegation in 2012, Finland in 2013-2014 and so forth.

Head of delegation

- 2017–2018: Denmark
- 2019–2020: Sweden
- 2021–2022: Finland

- 2023-2024: Norway
- 2025-2026: Denmark

and so forth.

According to the decision made in the Nordsync Annual Meeting 2013, the administrative and finance committee (AFC) assignments shall rotate every second year among the steering committee members following the order Sweden-Finland-Norway-Denmark, with the exception during 2014–2017. This was due to Norway acting as the chair of the AFC in 2012–2015.

The (three) two-year rotations of AFC HoD follow:

- 2016–2017: Norway
- 2018–2019: Sweden
- 2020–2021: Finland
- 2022-2023: Denmark
- 2024-2025: Norway

and so forth

Representation in 2019

The representation of Nordsync in the ESRF Council by the steering committee was in 2019 as follows:

- Head of Delegation: Ingmar Persson, Sweden (June & November Council, and March and September HoD meeting)
- Delegate: Paula Eerola, Finland (June and November Council)
- Delegate: Helmer Fjellvåg, Norway (June & November Council)
- Adviser: Sine Larsen, Denmark (June & November Council)

The representation of Nordsync in the AFC in 2019 was as follows:

- Hanifeh Khayyeri, Sweden, delegate (Head of Delegation: May and October AFC)
- Ritva Taurio, Finland, delegate (May and October AFC)
- Aase M. Hundere, Norway, delegate (October AFC)
- Victoria Fuglsang-Damgaard, delegate (June and November Council, and October AFC)

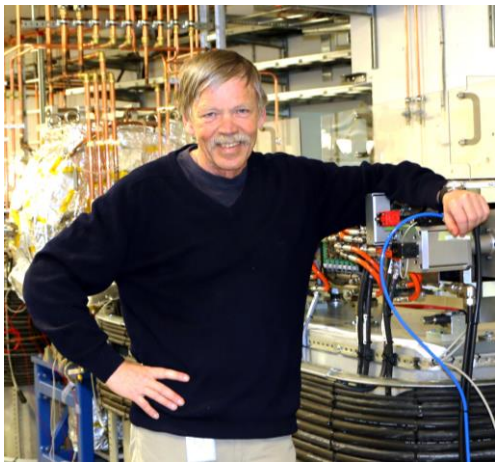
Purchasing advisors

Sweden: Johan Holmberg, johan.holmberg@vr.se
Norway: Ole Petter Nordahl, Ole.Petter.Nordahl@cern.ch
Denmark: Nikolaj Zangenberg, nzg@teknologisk.dk, adviser (May and October AFC; June and November Council)
Finland: Finland has no purchasing advisor

The visibility of Nordsync at ESRF

Mikael Eriksson, previous machine Director at MAX IV is representing Nordsync in the ESRF Machine Advisory Committee (MAC) 2015-2020. The present machine director at MAX IV, Pedro F. Tavares, was approved as member of the MAC 2018-2020 as proposed by the ESRF management. Per Ahlberg from Uppsala University, Sweden, is the Nordsync representative in the SAC for the period 2018-2020 as approved by the

ESRF Council November 2017. Due to the Corona pandemic the period of service in MAC and SAC was extended by one year.



Mikael Eriksson, *former Machine Director at MAX IV MAC – 2015-2021*

Per Ahlberg, *Uppsala University SAC – 2018-2021*

Pedro F. Tavares, *Machine Director at MAX IV MAC – 2018-2021*

Review committees for beam time allocation

There has not been any review work except in one of the panels, C10, at the ESRF during 2019 due to 20 month long shut down due to up-grade phase II, see above. The review panels have therefore been dormant and have had almost the same composition as during 2018. The total number of beam time allocation committees in 2018-2019 was 12. The committees are nominated by the Research Directors at ESRF. All member countries are welcome to suggest candidates for the committees and the Nordsync consortium generally encourages national user communities to take this opportunity. The members from Nordsync countries in the committees are shown in bold.

C01 (Beamlines: ID02, ID03, BM25B, BM32) - Chair: Christopher Lucas, UK**, Oliver Balmes**, Lund University,Sweden
This committee deals with surfaces and interface science, including diffraction and spectroscopy.

C02 (Beamlines: ID11, ID15A, ID22, ID31) - Chair: Artem Abakumov, Russia
This committee deals with proposals related to chemistry, atomic structures of material, engineering materials sciences and diffraction.

C03 (Beamlines ID12, ID32) - Chair: Andrea Severing, Germany
This committee deals with spectroscopy, magnetism, chemistry and the electronic structures of materials.

C04 (Beamlines: BM08, BM16, BM20, BM23, BM25A, BM26A, BM30B, BM31) - Chair: Jeroen Van Bokhoven, Switzerland
This committee addresses the electronic and magnetic properties of materials; structural properties aspects are included but only when related directly to magnetic or electronic properties. Techniques/methods include EXAFS, Powder Diffraction, Magnetism.

C05 (Beamlines: ID06-LVP, ID15B, ID27, BM01) - Chair: Philip Salmon, United Kingdom
This committee deals with studies of the structures of ordered systems, studies under extreme conditions, dynamics and spectroscopy.

C06 (Beamlines: ID17, ID19) - Chair: Robert Cernik, United Kingdom, **Sophie Sanchez**, Uppsala University, Sweden
This committee deals with studies of industrial or engineering relevance, as well as biomedical research involving 2D-3D X-ray imaging. In addition it reviews radiobiology and radiotherapy-related proposals.

C07 (Beamlines: ID16A-NI, ID16B-NA, ID21) - Chair: Francesco Giannici, Italy, **Henrik Birkedal**, Aarhus University, Denmark
This committee reviews proposals involving nanomaterial, environmental science, and spectroscopy.

C08 (Beamlines: ID02, ID13, BM26B) - Chair: Andrei Petukhov, The Netherlands.
This committee reviews proposals on SAXS and soft condensed matter.

C09 (Beamlines: ID09, ID10, BM02, BM28) - Chair: Anders Madsen, Germany, **Adrian Rennie,** Uppsala University, Sweden
This committee reviews proposals on spectroscopy and diffraction experiments on soft condensed matter.

C10 (Structural Biology Beamlines and Cryo-EM: ID23-1, ID23-2, ID29, ID30A-1, ID30A-3, ID30B, BM29, BM14U and BM30A) **-** Chair: Masimo Degano, Italy**, Jens Preben Morth**, Centre for Molecular Medicine Norway, Oslo, Norway, **Marjolein Thunnissen**, Lund University, Sweden
This committee reviews proposals to study the structures of biological macromolecules using X-ray crystallography and Cryoelectron microscopy. Experimental methods

include single or multi-wavelength anomalous dispersion (SAD/MAD), molecular replacement using fixed wavelength X-rays, and Laue techniques.

C11 (Beamlines: ID20, ID24, ID26) - Chair: Jérõme Rose, France.
The committee review proposals for a range of X-ray spectroscopic measurements studying electronic and magnetic excitations in matter using resonant and non-resonant inelastic X-ray scattering as well as emission spectroscopy.

C12 (Beamlines: ID18, ID28) - Chair: Valentina Giordano, France.
This committee deals with studies of the structures of ordered systems, studies under extreme conditions, dynamics and spectroscopy.

Staff at ESRF from the Nordic Countries

The representation of the four Nordic countries in the scientific and technical staff of the ESRF corresponds roughly to Nordsync's 5% share. Table 4 lists the names and nationalities of the three scientists and three engineers from the Nordsync countries, who for many years have contributed to the successful development of the ESRF.

In addition, many young scientists from the Nordsync countries are appointed in temporary positions to work at the ESRF. The Nordsync countries are well represented in the post doc staff of the ESRF. More recently also even younger people from the four Nordic countries have used the opportunities offered by the ESRF traineeships. Two trainees took part in the program in 2018. It is worth noting that the four Nordic countries are equally well represented in the post doc and trainee appointments.

Table 4. Staff with Nordic affiliation at the ESRF in 2019.

Thesis student
Laura Wollesen, Denmark, fixed-term contract November 18, 2019-November 17, 2021

PhD students
Luca Fardin, Sweden, PhD finalized in 2019-09-05 (co-funded by ESRF and SRC)
Mustafacan Kutsal, Denmark, 2017-11-01- present (co-funded by ESRF and DTU)

Scientist
Veijo Honkimäki, Finland, permanent contract since July 1, 2001
Michel Wulff, Denmark, permanent contract since April 1, 1990

Engineer
Staffan Ohlsson, Sweden, permanent contract since October 1, 1996
Marcus Oskarsson, Sweden, permanent contract since April 1, 2014
Olof Svensson, Sweden, permanent contract since October 1, 1999

The Swiss Norwegian Beam Line (SNBL)

The Swiss Norwegian Beam Lines (SNBL) at ESRF, covering BM01 and BM31, have been closed during the EBS upgrade period. Significant improvements in the beam characteristics at both stations are expected, and investment have been made as to

prepare the beam lines for commissioning in 2020. The scientific output in terms of publications and experiments is excellent, and highly acknowledged by the ESRF. Major concerns arose during 2018-19 when the Swiss funding partner (Paul Scherrer Institut, PSI) of the collaboration agreement announced that Switzerland will withdraw at the end of the contract period in 2020. The concerns on the Norwegian side as 50% share-holder of SNBL, were strongly shared by the Swiss user communities, board members of the SNX Council, international user groups and ESRF management, and major efforts were made to identify short and medium term solutions. End of 2019, the EPFL with full support from ETH-Z, committed themselves to take on responsibility for 4 year continued operation of SNBL, to the best of the Swiss user community. Currently negotiations are ongoing with the Norwegian funding (contract) partner, NTNU, Trondheim. During this difficult time, the work in the SNX Council has been headed by prof. Helmer Fjellvåg (University of Oslo), along with prof. Bjørn C. Hauback (IFE, Kjeller), prof. Magnus Rønning (NTNU, Trondheim), and three Swiss council delegates. The strong support from the Research Council of Norway has been most important during talks and negotiations.

Purchases from the Nordic countries

The return coefficient for purchases from the Nordic countries has always been low. The situation has improved significantly since late 2015 due to the purchase of magnets for EBS from the Danish company Danfysik, however, the increase in return coefficient is decreasing as years go on. The return coefficient in for the period of January 1st 2017 to March 31st 2020 was 0.54. The full statistics is presented in Appendix 5.

Nordsync annual meeting 2019

Nordsync held its annual meeting at the Swedish synchrotron light facility MAX IV in Lund on October 15, 2019. The minutes of the meeting are included as Appendix 6.

The annual meeting 2020 will be held as an internet meeting on October 8, 2020.

General Directorship of the ESRF

The contract of the present director general at the ESRF, Francesco Sette, terminates on December 31, 2020. The position for maximal five years was therefore announced open in March 2019 with the closing date April 24, 2019. A selection committee consisting of the Chair and vice-Chair of the Council, and one person from each full member of the ESRF. Ingmar Persson did represent Nordsync in this committee. Ca. 30 applications were received of which 16 were regarded as serious. The committee selected eight candidates able to fulfil the position as director general at the ESRF, and seven of these were invited to interviews with the committee on August 27-29, 2019, in Brussels. One candidate, the only female, did withdraw her candidacy before the interviews. The committee found the present director general the most suitable candidate for the position. There was a discussion within the committee about the length of the upcoming mandate for Sette as he already has been director general for 10 years, and almost 10 years as physical science director. Therefore, a majority in the committee decided that a shorter mandate period than five years should be negotiated. After negotiations with Sette and a thorough discussion at the Head of Delegation meeting before the Council meeting on November 24, 2019, it was decided to offer Francesco

Sette the position as director general at the ESRF for a period of three years and eight months, thus until August 31, 2024, at time when Sette turns 67 years old. This offer has been accepted by Sette.

Machine and Physical Science Directorships of the ESRF

It was decided that the positions as Machine, Physical Science and Life Science Directors at the ESRF shall be announced 2020. The Nordsync representatives in the selection committee for a new Machine Director after Pantaleo Raimondi, who has decided to terminate position in slightly advance due personal reasons on September 30, 2020, was Sara Thorin, MAX IV, Lund University, Sweden and the committee for the two positions as Science Directors, Simo Huotari, University of Helsinki, Finland.

Appendix 1. Revised Agreement Concerning Nordsync

REVISED AGREEMENT CONCERNING

NORDSYNC

PREAMBLE

This REVISED AGREEMENT CONCERNING NORDSYNC supersedes the revised agreement concerning NORDSYNC as signed on 9 November 2007, 17 and 19 December 2007 and 8 January 2008, and the amendment as signed in 2011, revised by and between the research organisations of Denmark, Finland, Norway and Sweden.

Article 1
PURPOSE

NORDSYNC is a consortium of the research organisations in Denmark, Finland, Norway and Sweden which are parties to this Revised Agreement, and which represent their governments in the European Synchrotron Radiation Facility, ESRF. The purpose of NORDSYNC is to support scientific and technical developments in the field of synchrotron radiation and to promote the scientific, technical and industrial utilisation of the ESRF by scientists and organisations from the Nordic countries.

Article 2
MEMBERS

The members of NORDSYNC are:

Styrelsen for Forskning og Uddannelse (SFU / DAFSHE) of Denmark,
Suomen Akatemia (SA) of Finland,
Norges forskningsråd of Norway,
Vetenskapsrådet (VR) of Sweden,

as representatives of their respective governments.

Any member can make its approval of decisions concerning NORDSYNC conditioned by government approval.

Article 3
MEMBERSHIP OF THE ESRF COMPANY

ESRF is registered as a company (Société Civile) under French law and DAFSHE of Denmark represents NORDSYNC as a member of the company.

DAFSHE shall also subscribe to the NORDSYNC shares (500 shares of 1.525 EUR each) of the registered capital of the company.

Article 4
FINANCIAL CONTRIBUTION

The total annual contributions from NORDSYNC to ESRF are determined according to the ESRF convention and statutes.

The members shall share the financial contributions to ESRF from NORDSYNC based on the DONE shifts with CRG use included.

The shares shall be calculated as an average of the use of ESRF during a three-year period. The shares are updated every third year. The calculation of ESRF and NORDSYNC usage is done as described in Appendix 1. The shares shall be reported annually in the annual report (see Art. 6).

The shares for a three-year period shall be calculated based on the use of ESRF in the previous three-year period. Future shares of contributions shall be agreed upon for successive periods of three years.

Exceptional procedure for calculation of shares during the long shut-down in 2019–2020 is explained in Appendix 3.

In case of overuse of ESRF, the additional contribution from the members shall be based on the shares of the three-year period during which the ESRF Council confirms the additional contribution. NORDSYNC may take measures to limit overuse by defining a capping limit, see Appendix 1.

If no member requests a renegotiation at least one year before the end of a certain three-year period, the method of calculation shall be valid by tacit agreement also for the following three-year period. A request for renegotiation must be made in writing and sent by post or e-mail to all members to their official addresses.

Article 5
STEERING COMMITTEE AND REPRESENTATION IN THE ESRF

The NORDSYNC steering committee has a representative from each of the members. The members of the steering committee represent NORDSYNC in the ESRF Council as:

1. Member of Council and Head of Delegation
2. Member of Council
3. Member of Council
4. Adviser in the Council and substitute for a member.

The council assignments shall rotate every second year among the steering committee members following the order Sweden-Finland-Norway-Denmark, with the Swedish representative acting as Head of Delegation in 2019–2020 and so forth.

NORDSYNC also has a representative from each of the members in the Administrative and Finance Committee (AFC) of ESRF. The representatives represent NORDSYNC in the ESRF AFC as:

1. Member of AFC and Head of AFC Delegation
2. Member of AFC
3. Member of AFC
4. Observer and substitute for a member

The AFC assignments shall rotate every second year among the AFC members following the order Sweden-Finland-Norway-Denmark, with the Finnish representative acting as Head of Delegation in 2020–2021 and so forth.

The representatives of NORDSYNC in the ESRF Council and the ESRF AFC are appointed by the respective member organisation or ministry of each member country.

NORDSYNC shall seek a fair Nordic representation in all bodies of the ESRF.

Article 6
WORKING PROCEDURES

The NORDSYNC members shall meet at least once a year at the Annual Meeting, which is called by the Head of Delegation in the Council.

Each year, the members shall produce an Annual Report of the NORDSYNC activities. The report shall contain the shares of each member organisation. The responsibilities of the members are detailed in Appendix 2.

The steering committee shall seek a unanimous position in Council matters of principal importance such as major organisational changes within the organisation of the ESRF and substantial changes in the contributions from the NORDSYNC members to the ESRF. The ESRF Council members are bound by an expressed majority opinion of the steering committee and they should abstain from voting in matters where a committee majority could not be achieved.

Article 7
ECONOMY

The annual contributions are paid directly from the NORDSYNC members to the ESRF.

The steering committee shall provide information and contact to Nordic industries concerning possible deliveries to the ESRF.

Travel and other NORDSYNC-related costs for steering committee members and other representatives of NORDSYNC are covered by the respective member organisations.

Article 8
NEW MEMBER ORGANISATIONS

New member organisations can be admitted to NORDSYNC with unanimous consent by the existing members and by agreement with the ESRF.

Article 9

AMENDMENTS

This Revised Agreement may be amended by unanimous decision of the members.

Article 10
DISPUTES

The members shall endeavour to settle by agreement any dispute which may arise in matters concerning NORDSYNC. If agreement cannot be reached, the dispute shall, at first instance be referred to the Director Generals of each member organisation, before it is referred to the Nordic Council of Ministers at the request of a party to such a dispute.

Article 11
ENTRY INTO FORCE/DURATION

This Revised Agreement shall enter into force as from 14 May 2020. It is valid for the period in which NORDSYNC is committed to the ESRF. Notice of termination can be given by any member on the same terms that apply for the NORDSYNC membership to the ESRF, i.e. with three years notice, such notice to be given to the Nordic Council of Ministers and to the Government of the French Republic. Withdrawal can only take effect on 31 December 2022 or at the end of each successive period of three years.

This Revised Agreement supersedes the former agreement concerning NORDSYNC, signed 9 November 2007, 17 and 19 December 2007 and 8 January 2008, and the amendment as signed in 2011, which agreement shall become null and void.

Signed on behalf of Styrelsen for Forskning og Uddannelse (SFU / DAFSHE)	Signed on behalf of Suomen Akatemia
Date and name	Date and name
Signed on behalf of Norges Forskningsråd	Signed on behalf of Vetenskapsrådet
Date and name	Date and name

Appendix 1. Calculation of national shares

Calculations of national shares

1. The calculations are based on data delivered by the ESRF containing information for each proposal on the number of DONE shifts, participating institutions, their nationality, and whether the proposal is a CRG proposal, normal proposal, or industrial proposal.
2. The National Fraction for each proposal is calculated as the number of participating institutions from the particular country divided by the total number of participating institutions. “Institutions” are considered identical if they have the same postal address unless they belong to different research institutions or organisations. Only institutions from ESRF members or ESRF associates are considered. The ESRF itself is considered a member institution.
3. A weight of 0.25 is assigned to the CRG proposals and a weight of 1.0 to the normal proposals. Industrial proposals are assigned a weight of 0.0.
4. For each proposal the weighted number of shifts is calculated as (Number of DONE shifts) × (National fraction) × (Weight)
5. The national share is calculated as (sum of weighted number of shifts for each country)/ (sum of all weighted number of shifts for all NORDSYNC countries).

Payment for overuse at the ESRF

In case of a request from the ESRF for an exceptional contribution[1] due to overuse exceeding JRCmax, the contribution from each NORDSYNC country shall be calculated using the national share valid for the year where the additional contribution is to be confirmed at the ESRF council.

Measures to limit NORDSYNC overuse

NORDSYNC can take measures to limit overuse by defining a capping limit. This capping limit shall be informed to ESRF in writing. NORDSYNC delegates to Council and AFC need to follow up that ESRF takes the capping limit into account when distributing beam time.

[1] According to the procedure given in the document Item 7c at the 58th Meeting of the ESRF Council on 26–27 November 2012 and Item 7c at the 70th Meeting of the ESRF Council on 26–27 November 2018.

Appendix 2. Responsibility of delegates

Annual Meeting and Report:

- The Head of Delegation of Council calls the Annual Meeting and sends out the agenda and relevant documentation at least seven days before the meeting. The Head of Delegation of Council is furthermore responsible for drafting the minutes from the Annual Meeting, which should be included in the Annual Report.

- The Head of Delegation of Council chairs the Annual Meeting.

- The Head of Delegation of Council from the previous year is, together with the AFC-delegate of the member country, responsible for drafting the Annual Report.

- The draft of the Annual Report shall be circulated to the other NORDSYNC members before the Annual Meeting, where the report will be discussed.

- The Annual Report must be finally approved by the NORDSYNC delegates.

Head of Delegation of Council and AFC:

- The NORDSYNC Head of Delegation of Council is responsible for attending the ESRF Head of Delegation meetings and report back to the NORDSYNC delegates.

- The NORDSYNC Head of Delegation of Council receives the information from ESRF on usage and is responsible for the initial calculations of the member shares.

- The NORDSYNC Head of Delegation of AFC is responsible for replying to ESRF requests regarding financial decisions (e.g. approving of Written Procedures).

- The Swedish AFC delegate receives the Call for Contributions to ESRF and is responsible for the initial calculations of the member contributions, as well as sending out the quarterly request for Call for Contributions to ESRF with the member contributions.

NORDSYNC delegates:

- Each NORDSYNC country delegation is responsible for ensuring that the member organisation is informed about the NORDSYNC work.

- Delegates are responsible for ensuring they have the appropriate mandate from the respective member organisation for decision-making.

- Delegates must inform Head of Delegation of Council and AFC in good time if they have concerns regarding ESRF decisions (e.g. Written Procedures or decisions items on the Council agenda).

- Delegates are responsible for making sure that the final calculations of the share and financial contributions of their member organisation is correct.

Appendix 3. Procedure during long shutdown (2019–2020)

The installation of the new magnetic lattice necessitates a 20-month shutdown of the ESRF starting on 10 December 2018. User operation at the ESRF resumes late 2020. As a consequence of no delivered beam time in 2019 and 2020, an average for the years 2009–2018 shall be used as the annual percentage of the distribution of shifts between the NORDSYNC members. A 10-year average is used in order to seek a fair distribution across the members and their use over time and mitigate for any considerable fluctuations.

The following distribution of shares shall thus be applied for the years 2019 and 2020:

- Denmark: 23.96 pct.
- Finland: 13.01 pct.
- Norway: 21.53 pct.
- Sweden: 41.50 pct.

From 2021, the calculation of the national shares shall resume normal procedure.

The distribution of shares for the period 2023–2025 shall exceptionally be based on the use of ESRF in the four-year period 2018–2021. After that, the calculations will be based on normal three-year periods.

Appendix 2. Beam time statistics

The following statistics show beam time requested and delivered March 2019 – February 2020, on the cryo electron microscope (BL CM01), the only experimental station available for users December 10, 2018 – August 25, 2020.

	Total	Denmark	Finland	Norway	Sweden
Requested no. of shifts	753	0.45	9.35	0.64	46.72
Delivered no shifts	494	0.36	0.31	0.48	18.51
Delivered percentage		0.07	0.06	0.10	3.75

Appendix 3. ESRF beam-lines after up-grade phase II

Overview of beamlines at the ESRF after the upgrade 2019-2020. ID denotes beamline with insertion device as undulator or wiggler and BM denotes bending magnet beamline, and beamline in italic is presently not operational.

ID01	Nano/Micro-diffraction Imaging Beamline	Open
BM01	Swiss-Norwegian Diffraction and Crystallography CRG Beamline (SNBL-I)	Open
ID02	Time-Resolved Ultra Small-Angle X-Ray Scattering Beamline	Open
BM02	French Anomalous Diffraction and SAXS/WAXS CRG Beamline (D2AM)	Open
ID03	Surface Diffraction Beamline (will become the new EBSL Beamline for Hard X-ray Microscopy)	Closed
BM05	X-ray Imaging Beamline	Not Public
ID06-HXM	Hard X-ray Microscopy Beamline (new beamline, will eventually move to ID03	Open
ID06-LVP	Large Volume Press Beamline	Open
BM07	French Biological Macromolecules Diffraction CRG Beamline (FIP2-BM07, new beamline)	Open
BM08	Italian X-ray Absorption and Spectroscopy CRG Beamline (LISA)	Open
ID09	Time resolved Structural Dynamics Beamline	Open
ID10	Soft Interfaces and Coherent Scattering Beamline	Open
ID11	Materials Science Beamline	Open
ID12	Circular Polarisation Beamline	Open
ID13	Microfocus Beamline	Open
BM14	Dutch-Belgian Spectroscopy CRG Beamline (DUBBLE-II, new beamline replacing BM26A)	Open
ID15A	Materials Chemistry and Materials Engineering Beamline	Open
ID15B	High Pressure Diffraction Beamline	Open
ID16A-NI	Nano-Imaging Beamline	Open
ID16B-NA	Nano-Analysis Beamline	Open
BM16	French Absorption Spectroscopy CRG Beamline (FAME-UHD)	Open
ID17	Biomedical Beamline	Open
ID18	Nuclear Resonance Beamline	Open
BM18	EBSL Imaging Beamlin (new bemline)e	Under construction
ID19	Microtomography Beamline	Open
ID20	Inelastic Scattering I Beamline	Open
BM20	The Rossendorf Beamline (ROBL)	Open
ID21	X-ray Micro spectroscopy Beamline	Open
ID22	High Resolution Powder Diffraction Beamline	Open
ID23-1	Structural Biology MAD Beamline	Open
ID23-2	Structural Biology Microfocus Beamline	Open
BM23	X-ray Absorption Spectroscopy Beamline	Open
ID24	High Brillance X-ray Absorption Spectroscopy - Scanning and Energy Dispersive XAS (upgraded beamline)	Under construction
BM25A	Beamline moved to Alba	Closed
BM25	Spanish Spectroscopy and Diffraction CRG Beamline (SpLine, new beamline replacing BM25B)	Open
ID26	X-ray Absorption and Emission Spectroscopy Beamline	Open

BM26	Dutch-Belgian SAXS/WAXS CRG Beamline (DUBBLE-I, new beamline replacing BM26B)	Open
ID27	High Pressure Beamline (upgraded beamline)	Under construction
ID28	Inelastic Scattering II Beamline	Open
BM28	UK Materials Science CRG Beamline (XMaS)	Open
ID29	EBSL Structural Biology SSX Beamline (upgraded beamline)	Under construction
BM29	Structural Biology Bio-SAXS Beamline	Open
ID30A-1	Structural Biology Mail-in Beamline	Open
ID30A-3	Structural Biology Minibeam Beamline	Open
ID30B	Structural Biology MAD Beamline	Open
BM30	French Absorption and Spectroscopy CRG Beamline (FAME, new beamline replacing BM30B))	Open
ID31	Interface and Material Processing Beamline	Open
BM31	Swiss-Norwegian XAS and HRPD Beamline (SNBL-II)	Open
ID32	Soft X-ray Spectroscopy Beamline	Open
BM32	French Surfaces & InterFaces CRG Beamline (IF)	Open
Cryo-EM CM01	Structural Biology Single Particle Cryo-Electron Microscope	Open

Appendix 4. Calculation of the national shares

Calculations of the national shares

6. The calculations are based on data delivered by the ESRF containing information for each proposal on the number of DONE shifts, participating institutions, their nationality, and whether the proposal is a CRG proposal, normal proposal, or industrial proposal.
7. The National Fraction for each proposal is calculated as the number of participating institutions from the particular country divided by the total number of participating institutions. “Institutions” are considered as identical if they have the same postal address unless they belong to different research institutions or organisations. Only institutions from ESRF members or ESRF associates are considered. The ESRF itself is considered as a member institution.
8. A weight of 0.25 is assigned to the CRG proposals and a weight of 1.0 to the normal proposals. Industrial proposals are assigned a weight of 0.0.
9. For each proposal the weighted number of shifts is calculated as (Number of DONE shifts) × (National fraction) × (Weight)
10. The national share is calculated as (sum of weighted number of shifts for each country)/(sum of all weighted number of shifts for all Nordsync countries).

Payment for overuse at the ESRF

In case of a request from the ESRF for an additional contribution due to overuse in the preceding three years, the contribution from each Nordsync country shall be calculated using the national share valid for the year where the additional contribution is to be confirmed at the ESRF council.

‡ According to the ANNEX 1 to document on Scientific juste retour, “Guidelines for a Re-adjustment of Contribution Rates”, ESRF 10 June 1998.

Appendix 5. Purchase return coefficients for Nordsync

Evolution of “purchase return coefficients” from January 1996 to March 2020

Period	Return coefficient
1/96–12/98	0.26
1/97–12/99	0.17
1/98–12/00	0.25
1/99–12/01	0.28
1/00–12/02	0.33
1/01–12/03	0.31
1/02–12/04	0.34
1/03–12/05	0.54
1/04–12/06	0.50
1/05–12/07	0.63
1/06–12/08	0.58
1/07–12/09	0.57
1/08–12/10	0.50
1/09–12/11	0.41
1/10–12/12	0.37
1/11–12/13	0.31
1/12–12/14	0.30
01/13–12/15	1.21
01/14-12/16	0.95
01/14-12/17	0.93
01/16-12/18	0.52
01/17-03/20	0.54
Historical average	0.49

Appendix 6. Minutes from the annual Nordsync meeting in Lund October 16, 2019

Time: 10.00-15.00
Place: MAX IV Laboratory, Fotongatan 2, Lund, room VIXAM (4th floor)

Participants:

Ingmar Persson (chair, SE Council delegate)
Sine Larsen (DK Council delegate)
Helmer Fjellvåg (NO Council delegate)
Paula Eerola (FI Council delegate)
Aase Hundere (NO AFC delegate)
Ritva Taurio (FI AFC delegate)
Victoria Fuglsang Damgaard (DK AFC delegate)
Hanifeh Khayyeri (SE AFC delegate/HoD)

§1. Welcome and opening of meeting.
Ingmar opens the meeting.

§2. Adoption of agenda. (Ingmar)
Agenda is adopted.

§3. Approval of minutes from the 2018 Nordsync annual meeting in Copenhagen
Minutes are approved. Minor changes in wording can be sent to Victoria by the end of the week.

§4. Nordsync Annual Report 2018. (Sine and Victoria)
a/ Review of the draft report. (Sine, Victoria)
A paragraph will be added about the use during shut-down. Additional text-edits have to be sent to Victoria by 25 Oct, 2019.

ESRF announces opportunities at the facility, such as traineeship, PhDs and postdocs. Council members who get this information can forward or share in national forums.

b/ Beam-time use of ESRF within Nordsync in 2018. (Victoria)
Forecast for Nordsync shares 2020-2022 are presented. It was agreed that the shares should be presented in also the Nordsync Annual Report 2018.

§5. Report from the HoD meeting, September 27, 2019, in Brussels. (Ingmar)
Information about the recruitment process of the ESRF Director. Council will set up a group to handle the difficulty when all Directors will be replaced in short time.

Discussion about improving employment conditions with the prolonged appointment of the Director position. Nordsync delegates agree that the situation needs to be improved.

Jennifer Pickett will continue as AFC chair one more year (2020).

§6. a/ Nordsync position on the ESRF proposed budget for 2020. (AFC delegates)
Round table on the positions: NO 2,0%; DK 1,5%; FI 2,0%; SE 1,5%. Nordsync delegates agree to present 1.5% to ESRF AFC due to the larger shares of SE and DK.

b/ Discussions prior to the AFC Council meeting. (AFC delegates)
Nothing to add.

c/ Nordsync representation in SAC, MAC and proposal review panels.
Discussion about how to reach out to the researchers and get nominations from the Nordsync countries. Council delegates will step up a bit and get in touch with their respective contacts. Ingmar will check with the science directors about timing to propose new delegates to review panels.

§7. Expected future Nordsync use of ESRF, capping on Nordsync and national level (Ingmar)
Some members are interested in capping usage on national level. Nordsync members need to agree on a model that works for everyone, since exceptional contribution is more expensive than normal shares. AFC-delegates will develop a model in Q1 2020.

§8. Decisions and responses to the ESRF
a/ Decision about the ESRF search committee for the Machine director position, see e-mail from Itziar Echeverria Friday October 11 at 13:17. (Ingmar)
Accept.

b/ Decision about the progress of the director general position at the ESRF, see e-mail from Itziar Echeverria Friday October 11 at 13:08. (Ingmar)
Accept.

c/ Report from the working group of directorship structure, see e-mail from Itziar Echeverria Friday October 11 at 13:17. Shall any actions from Nordsync be taken? (Ingmar)
Agree that the suggestion is good, but not approving the cost. AFC delegates to check if the extra funding has been included in the budget 2020.

Helmer wondered if there is need to re-open two beamlines which have been shut for a long time. Everybody agreed.

§9. Discussion about the updated Nordsync agreement as proposed by the AFC delegates, see–mail from Hanifeh Khayyeri October 15.
Nordsync agreement is being updated. Final suggestions to be sent to Ritva before it is sent to respective legal departments.

§10. Discussion of the upcoming ESRF Council meeting, November 25-26, 2019. (Ingmar)
The process of the recruitment of general director needs to be followed in detail as the it has been unclear on several points, Nordsync has proposed to establish a working group to come up with a proposal of timing for hiring new or prolongation of members

in the management team. This needs to be followed up. Ingmar will check will other delegates about the view of having a Council chairman who at the same time is director general at competing synchrotron light facility. See decision under §8 above.

There was discussion about three matters. First, Nordsync agreed to keep the order and starting years of Council and AFC HoDs as they are now. Secondly, Nordsync agreed to shift the period of the use of ESRF where the shares shall be calculated closer to the three-year shares period. During the long shut-down period we use the 10-year averages for calculating the shares for 2023-2025. Thirdly, the Swedish AFC-delegate continues to deliver the calls for contributions to the other Nordsync partners.

§10. Update on the progress of the future financing of the Swiss-Norwegian beamline (Helmer)

Progress is being made and there is a willingness to find a solution. [Helmer do you want to formulate something here?]

§11. Information on national status regarding the projects MAX IV, ESS and EU-XFEL. (Ingmar)

The annual MAX IV user meeting was held September 23-25 in Lund. 5 beamlines are in general use and 4-5 beamlines are in commissioning and will be ready for general use Feb 2020. Next 2-3 beamlines will start commissioning with a plan to be open for users in the fall 2020. The constructution of the ForMAX beam-line has started.

ESS progressing. A large part of the construction is in place.

XFEL is doing well. Scandinavian (SE; DK) users are very strong. Swedish community usage is very high, which is a success story. DK has good usage too and wants to increase the use of XFEL .

§12. Information on relevant national activities in relation to user community. (Sine, Helmer, Paula)

Denmark: Danscatt works well, the annual meetings are well attended. The Danish neutron-community is engaged in the construction of instruments at ESS.
Finland: Keeping focus on large infrastructures and better funding for universities and research. Next year there will be no call for infrastructure funding because of updating of the infrastructure roadmap.
Norway: Norscatt community initiated but has not had any meeting so far. Call for competence-building nationally is ongoing.
SE: Info as in MAX IV above. New director at MAX IV, Ian McNulty. The process to hire a new physical science director has been initiated

§13. Up-date of the LEAPS project. (Franz Hennies, MAX IV), at 11:40-11:55.

Presentation on the continuation of LEAPS project. LEAPS wants to be considered for co-fund action.

§14. Guided tour of MAX IV. (Ingmar)

§15. Other issues

Sine Larsen informed she will step down from Nordsync and the successor will be Henning Friis Poulsen.