Nordsync Annual Report 2020

Content

Edited by Anna Carlmark Malkoch (Swedish Research Council) and Ingmar Persson (Swedish University of Agricultural Sciences, Uppsala)

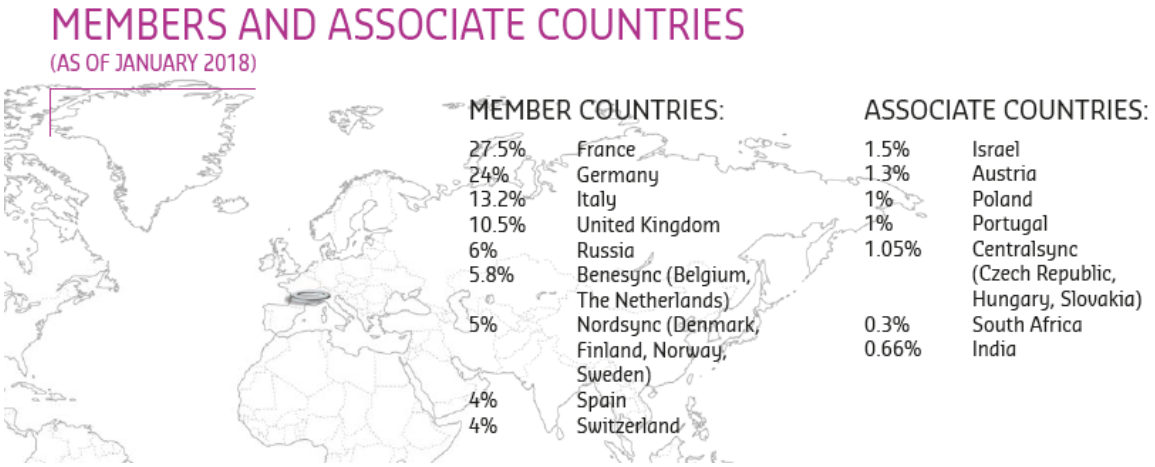
***Cover: New figure required**.*

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 implemented in 2020. 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 had two phases, Phase I, focused on the beamlines at a budget of 168 MEuro, was completed in 2015. Phase II included an exchange of the storage ring to become a 4th generation synchrotron source, the second after MAX IV, to become EBS (Extremely Brilliant Source), and four new flagship beam-lines to at a budget of 156.6 MEuro. The storage ring and 26 of the existing beam-lines became available for general users August 25, 2020.The planning of the Phase II EBS-project was completed in September 2015, and the implementation schedule were on time, an outstanding achievement taking into account that the Corona pandemic struck Europe in March 2020 forcing ESRF to close down for two months, March 16-May 11, 2020. One of flagship beamlines is the CDR2 – *Beamline for hard x-ray* in which the Danish ESRF delegate Henning Friis Poulsen plays an instrumental role. Since the re-opening of the ESRF in May 2020, only remote mode has been allowed as users are not allowed to come to the ESRF site due to the Corona pandemic. This situation persists in May 2021.

Activities at the ESRF in 2020

The ESRF-EBS did open for general users on August 25, 2020. Due to Corona pandemic restrictions only mailed-in samples run in remote mode or by beam-line staff have been allowed since the opening of the ESRF-EBS. This means that the available beam-time at the ESRF March 2020-February 2021 was 6309 shifts, compared to the last complete accounting period March 2017-February 2018 delivering 17091 shifts. Due to the corona pandemic the efficiency since of the opening of the ESRF August 25, 2020, was lower than under normal circumstances. Experiments which require the physical presence of users have therefore been postponed. The cryo-EM facility is managed like a synchrotron beamline (CM01) which has been open to users during 2020 during the periods when the ESRF was not affected by Corona pandemic restrictions. The beam-time statistics for ESRF-EBS from August 25 2020-February 2021, and CM01 March 2020-February 2021, are given in Appendix 1.

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)

<u>Legal documents</u>
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

The ESRF 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 the ESRF

At its 72th ESRF Council meeting in November 25-26, 2019, the ESRF Council approved the budget for 2020. The financial state reported at the 74th ESRF Council meeting in June 2020 showed a final out-turn of 105 913.4 kEUR including an overall balance of 10 814 kEUR for 2020. The Nordsync contribution to the ESRF budget for 2020 amounted to 6 381.50 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 (4 869.50 kEUR), and the scientific overuse of beam time of Nordsync countries according to ESRF rules for corrective measures (the exceptional contribution, 1 512.00 kEUR). An overview of Nordsync's contributions to ESRF in the period 2015–2020 is presented in Table 1.

Table 1. Nordsync's contributions to ESRF`s income budget in 2015–2020.

ESRF income budget	2015	2016	2017	2018	2019	2020
Share Members contribution (EUR)*	4,517,250	4,565,600	4,611,250	4,680,450	4,774,050	4,869,500
Exceptional contribution overuse beam time – corrective measure (EUR)*	776,407	1,052,114	1,240,665	1,211,000	1,283,000	1,512,000
Reserve for increase in electricity costs (EUR)*			161,560			
Total contribution Nordsync (EUR)*	5,293,657	5,617,000	5,868,071	5,891,450	6,057,050	6,381,500
Nordsync use beam time (%)	6.29	6.01	6.75	6.79	N/A	7.86 **
Nordsync ideal share (%)	4.81	4.81	4.78	4.75	N/A	4.76

*Source: Calls for contribution 2015–2020
** Statistics for the period March 2020-March 2021

<u>Corrective measures and effect on the distribution of beam time for Nordsync</u>
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. Nordsync 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 2020 is based on the “overuse” in 2017-2018. 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. The full beam-time statistics for the periods March 2019-February 2020 and March 2020-February 2021 are presented in Appendix 1, and the calculation rules for the national shares in Appendix 2.

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 2, including the Notice on the Nordsync scientific use calculations from 2019, 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 2019-2020 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
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
2020**	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.
** Actual distribution for the use in the period March 2020-March 2021 was: Denmark (19.85 %), Finland (13.49 %), Norway (23.66 %), Sweden (43.00 %). Total use of Nordsync scientists was 495.34 shifts of of totally 6309 shifts at the ESRF (7.85%).

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
- 2019–2020: Sweden
- 2021–2022: Finland
- 2023-2024: Norway
- 2025-2026: Denmark
- 2027-2028: Sweden

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 two-year rotations of AFC HoD follow:
- 2016–2017: Norway
- 2018–2019: Sweden
- 2020–2021: Finland
- 2022-2023: Denmark
- 2024-2025: Norway
- 2026-2027: Sweden

and so forth

Representation in 2020

The representation of Nordsync in the ESRF Council by the steering committee was in 2020 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: Henning Friis Poulsen, Denmark (June & November Council)

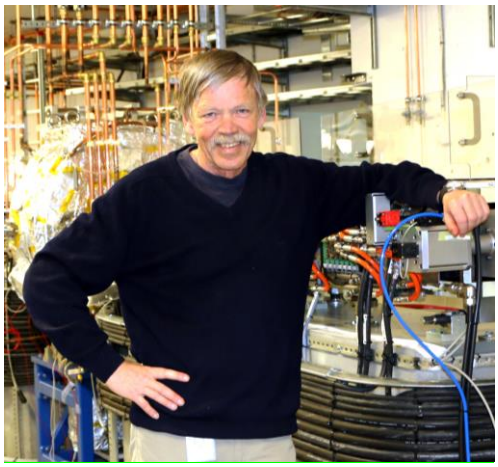
The representation of Nordsync in the AFC in 2020 was as follows:
- Hanifeh Khayyeri, Sweden, delegate (January-February 2020) and Anna Carlmark Malkoch (since March 2020, May and October AFC)
- Ritva Taurio, Finland, delegate (October AFC)
- Aase M. Hundere, Norway, delegate (May and October AFC)
- Morten Scharff, delegate (May AFC)
- Ditte Nissen Lund, delegate (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)
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

The review panels have been dormant during the shutdown period and have had almost the same composition as during 2018. The total number of beam time allocation committees in 2019-2020 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 2020.

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

Post doc.
Ola Gjonnes Grendal, Norway, contract period September 7, 2020-March 6, 2022

Scientist
Veijo Honkimäki, Finland, permanent contract since July 1, 2001
Michel Wulff, Denmark, permanent contract since April 1, 1990
Sami Vasala, Finland, contract period November 2, 2020-November 1, 2025

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; BM01 and BM31) at ESRF have during the EBS shutdown been prepared for taking advantage of the ESRF upgrade and having beam for test experiments and users during summer and autumn 2020. However, the covid-19 situation with severe restrictions on access, working hours and visitors, made the experimental program very challenging. However, excellent work by beam line staff, flexibility in allocation of experiments as well as shifting to remote users, made it still possible to deliver important set of data to the user society. Nevertheless, experiments requiring non-standard set-ups could not be run, which for instance prevented experiments like operando catalysis and battery studies. On the other hand, this paved way to modify the future user program by looking into how certain categories of experiments can be done with remote users. A new collaboration agreement for the period 2021-24 has been signed with EPFL, Switzerland and NTNU, Norway as contract partners, assuring the required yearly funding based on national consortia with public and institutional funding as well as user payment. The Norwegian partners remain un-changed; NTNU, Trondheim; UiO, Oslo; UiB, Bergen; UiS, Stavanger and IFE, Kjeller. The main part of the funding is provided by the Research Council of Norway to the consortium of the SNBL collaborating institutions. A plan for further upgrade of SNBL in the direction towards a strong profile of operando studies have been launched with implementation in 2021. Norway is represented by prof. Helmer Fjellvåg (UiO; chair and president of SNX foundation), prof. Magnus Rønning (NTNU) and prof. Bjørn C. Hauback (IFE) in the SNBL Council.

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 2018 to March 31st 2021 was 0.53. The purchase statistics is presented in Appendix 3.

Nordsync annual meeting 2020

Nordsync held its annual meeting on October 8, 2020, on-line via Zoom due to travel restrictions due to the pandemic. The minutes of the meeting are included as Appendix 4.

The annual meeting 2021 will be held as a digital meeting on October 7, 2021.

Machine Directorship of the ESRF

The positions as Machine Director at the ESRF after Pantaleo Raimondi, who has decided to terminate position in slightly advance due personal reasons on September 30, 2020, was advertised in the beginning of 2020. The Nordsync representative in the search and interview panel for a new Machine Director was Sara Thorin, MAX IV, Lund University, Sweden. The search and interview panel unanimously proposed Dr. Qing Qin from the High Energy Photon Source (HEPS), Beijing, China, as new Machine Director at the ESRF from October 1, 2020, or as soon as possible thereafter. At the 74th ESRF Council meeting in December 2020 Dr. Qing was appointed as director of the accelerator and source division at the ESRF.

Physical Science and Life Science Directorships of the ESRF

The positions as Physical Science and Life Science Directors at the ESRF for the period January 1, 2022 - December 31, 2026 were announced in early 2020. It was decided that the search and interview panel should handle both positions. The Nordsync representative in the search and interview panel was Simo Huotari, University of Helsinki, Finland. The search and interview panel unanimously proposed Dr. Annalisa Pastore, full professor of chemistry and molecular biology, Kings College, UK, as the most suitable candidate for the position as life science director of the ESRF, and Dr. Gema Martinez Criado, ESRF, France, Grenoble, as the most suitable candidate for the position as physical science director of the ESRF. At the 74th ESRF Council meeting in December 2020 Drs. Pastore and Martinez Criado were appointed as life science and physical science directors at the ESRF for maximum five years starting January 1, 2022.

Appendix 1. Beam time statistics

The following statistics show beam time requested and delivered March 2019 – February 2020, and March 2020-February 2021. The cryo electron microscope (BL CM01) was the only experimental station available for general users December 10, 2018 – August 24, 2020.

March 2019-February 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

March 2020-February 2021

	Total	Denmark	Finland	Norway	Sweden
Requested no. of shifts	17321	240.81	127.63	230.50	556.08
Delivered no shifts	6309	98.17	66.64	117.30	213.23
Delivered percentage		1.56	1.06	1.86	3.38

Appendix 2. Calculation of the national shares

Calculations of the 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 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.
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 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.

Datum
2019-12-12

Diarienummer
2018-0180

Handläggare
Hanifeh Khayyeri

Meeting participants:
Ritva Taurio (FI)
Aase-Marie Hundere (NO)
Victoria Fuglsang-Damgaard (DK)

Notice on the Nordsync scientific use calculations

Background
The AFC-delegates at the ESRF had a telephone meeting on 2019-12-12 where they discussed administrative arrangements on how to calculate the Nordsync members' scientific use in the future.

Every year, ESRF provides the Council delegates with a number of tables, which among other things specify the member states' use of the facility in the previous year. The Council delegates are thus provided with two documents ahead of the June Council meeting:

6. BT REQ ALL & DEL (master file): Provides the overview of each proposal round in a given year (two rounds) and the total year. The data is divided on scientific field, countries and beam time requested/beam time allocated/ beam time delivered.
7. Country specific proposals: The document provides data on each proposal in a certain year.

Proposed new procedure
Nordsync has for many years used the country-specific tables to calculate the respective Nordsync member scientific use. However, it was discovered that this method gives a different result than the method used by ESRF, when calculating the shares between the countries.

Against this backdrop the Nordsync AFC delegates decided on a set of administrative principles for future calculations of scientific use:

- Nordsync member scientific use will be based on the data provided by the ESRF in the master file[1]. For the calculation in a given year the data used should be the following:
    - The statistics in Year X/II and Year Y/I, which comprises a full proposal at the ESRF.
    - The statistics, which specifies the actual delivered beam time shifts (DONE shifts).

The Nordsync Annual Report will include a number of tables describing, which derives from the master file: 1) Annual distribution of the DONE shifts at ESRF between the Nordsync, 2) National shares of the Nordsync membership of ESRF and 3) Distribution of beam time statistics at ESRF pr. scientific area for the Nordsync countries in year XX. More detailed statistics specifying use per country divided on the main applicant will be enclosed in the

appendices of the Annual Report. It is noted that there might be a discrepancy between the tables in the Annual Report and the appendices; however the correct number is the one deriving from the master file.

Consequences of change in procedure
This approach will lead to some changes that are good to keep in mind.

- Only shifts DONE in BAG and Long Time Proposals (LTP)[1] in a certain year will be counted as the scientific use of that year. Previously BAG and LTP shifts were a fixed number until all shifts were done, which resulted in repeated calculations. With the new approach a small difference will be seen in the distribution of use between scientific domains. The changes may be especially notable compared to previous years for structural biology, where BAG and LTP are often applied for.
- The Annual Report in 2019 and the previous years has used the country-specific tables analysis of the scientific use. This will change from 2020.
- The master file contains ESRF beam time and EMBL-Grenoble beam time, which the country-specific tables do not contain.

This approach will be used to calculate the Nordsync member's scientific use from 2020, and also be the basis for calculating the internal distribution of shares between the Nordsync members. .

[1] Long Term Proposals have a duration of two years.

Appendix 3. Purchases and Purchase return coefficients for Nordsync

Evolution of “purchase return coefficients” from January 1996 to March 2021

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
01/18-03/21	0.53
Historical average	0.49

Purchases from Nordsync in 2020:

Country	**Amount (Euro)**
Denmark	36 748
Finland	25 560
Norway	0
Sweden	9 001
Total Nordsync	**79 309**

Appendix 4. Minutes from the annual Nordsync meeting via Zoom October 8, 2020

Time: 10:00-14:20, with lunch break 12:00-13:00

Place: Virtual meeting on Zoom (https://sunet.zoom.us/j/69909275963)

Participants:

Ingmar Persson (chair, SE Council delegate/head of delegation)
Anna Carlmark Malkoch (SE AFC delegate)
Henning Friis Poulsen (DK Council delegate)
Ditte Nissen Lund (DK AFC delegate)
Helmer Fjellvåg (NO Council delegate), § 1-7, 12-15
Aase Hundere (NO AFC delegate)
Paula Eerola (FI Council delegate)
Ritva Taurio (FI AFC delegate/head of AFC delegation)

§1. Welcome and opening of meeting. (Ingmar)

§2. Adoption of agenda. (Ingmar)
The agenda was adopted.

§3. Approval of minutes from the 2019 Nordsync annual meeting in Lund
The minutes were approved.

§4. a/ Nordsync Annual Report 2019. (Anna and Ingmar)
The annual report was gone through point by point and changes noted. Ingmar and Anna will work on a revised version to be circulated to the Nordsync members.
b/ Beam-time use of ESRF within Nordsync in 2019. (Ingmar)
This information can be found in Appendix 4 in the Annual Report from 2019

§5. Report from the virtual HoD meeting, September 25, 2020. (Ingmar)
Ingmar have sent out report prior to the meeting. Some points will be discussed separately under points 7, 8 and 9. ESRF is up and running in user mode since August 25th according to original plans which is an astounding achievement given the situation with the pandemic. The EBS is performing very well and have already reach the specific technical parameters aimed for the end of 2020. All experiments are now done by beam-line staff and user have to send in their samples. One user allowed in at the time at the entire ESRF. The financial situation: the total cost of the EBS project has increased with 1.0 MEuro. 6.5 MEuro are not yet allocated and will be expected to be covered by the members, 6.1 MEuro, and the associates, 0.4 MEuro, in 2023. The most urgent future investment is a 1 MW datacentre due to expected shortage in their ability to store experimental data. All data collected at the ESRF are stored for at least 3 years. HoD was informed that the contract of Itziar Echeverria as head ESRF Council secretary will be extended another five years 5 years. The HoD was very pleased that Itziar remains in her position as she is doing

an excellent work. Nordsync thanked Ingmar for sending out the notes from the HoD meetings.

§6. a/ Nordsync position on the ESRF proposed budget for 2021. (AFC delegates)

It seems likely that Nordsync will propose the 1.5 % alternative increase of the 2021 budget (ESRF has suggested wither 2 % or 1.5 %). It may be a close race between the two alternatives, 1.5 and 2 % increase, at the voting at the December Council meeting. Italy will probably propose no increase in budget. France have not yet declared and their position will have a deciding impact on the outcome.

Denmark position: important to have documentation of the 2 % inflation rate that France has declared. Ingmar suggested that Denmark takes contact with the ESRF or the Danish Embassy in France for more official numbers of the inflation rate.

Norway position: can support 2 % but will go with the majority.

Finland position: not had any comments from ministry but such a small difference does not make a major increase in the use of the ESRF.

Sweden position: no official comments from ministry. Anna will try and get a reply and before the AFC delegates will meet prior to the AFC meeting on the 15th of October.

b/ Discussions prior to the AFC Council meeting. (AFC delegates)

Exceptional contribution from NordSync 2021 will be 1,064 MEuro with a 2 % budget increase and 1,060 MEuro with the 1.5% alternative. The exceptional contribution to the ESRF in 2021 will in the order 550 kEuro as it includes two years of the Up-grade II shut down in 2019 and 2020 in the 3-years average (2018-2020) overuse. The exceptional contribution in 2022 will be based on the overuse in 2021.

§7. Expected future Nordsync use of ESRF, capping on Nordsync and national level (Ingmar)

Aase and Ingmar sent an e-mail to the ESRF about exceptional contribution, especially as Sweden wanted a national capping that would not affect the other Nordic countries. This lead to a meeting with the ESRF director general Sette, the Swedish director general of the Swedish Research Council, Sven Stafström, the Head Secretary of Research Infrastructure of the Swedish Research Council, Björn Halleröd and Ingmar. ESRF could not accept national capping with the Nordsync set-up but Sette did bring up a possible solution. Presently a 10 % overuse is allowed before a country or consortium start to pay exceptional contribution, which means that Nordsync can use 0.5 % extra beam time (in total 5.5 %) for free. Sette suggested to increase the allowed overuse to 20 % instead, which would mean the Nordscyn could use 6 % of beam time before we are charged with an exceptional contribution. In early September, it became apparent that this would have to go through Council and also that the ESRF have a long-time problem with an unbalance between ownership and allocated/used beam-time. Presently Italy has an underuse of ca. 2 %, and Germany and Russia a slight underuse. Nordsync is the only member presently paying exceptional contribution. This situation has lasted for many years. Previously, 2009-2010, there was acute situation with Italy and United Kingdom having a large underuse. This resulted in that Russia became a new member of the ESRF with 6% of the shares, and Nordsync increased its shares from 4 to 5%, while Italy and United Kingdom decreased their ownership, and minor adjustments were made for some other members. In this process the limited free overuse was decreased from 25% to the present 10%. At the HoD meeting

on September 25, 2020, director general Sette brought up the importance of the ESRF with a now world leading facility after the up-grade II to attract the most out-standing science to the ESRF. In order to achieve this he proposed to increase the limit before exceptional contributions are put back to 25 % or 20 %. He did also mention the problem with the unbalance between ownership and use of the ESRF, and that countries/consortia with an over- or underuse over long time, as the overuse of Nordsync, should be corrected to achieve a balance between ownership and use. Nordsync was not mentioned during this presentation, but the suggestion that ESRF may go back to the old model. Sette proposed to perform an analysis of such a change by going back to allow 25 % overuse without paying exceptional contribution. This proposal and the situation with an unbalance between ownership and use will be discussed at the next Council meeting in December 2020, and a possible change of the present cost for overuse can be taken at earliest at the Council meeting in June 2021, and should then be effective from 2023. The problem with the ownership/usage unbalance is a different question and whether this will be discussed in parallel is uncertain. It is a risk that there will be a huge pressure on Nordsync to balance its share, which means that Nordsync has to increase their shares to current usage. Since capping to 6.5% of total beam-time at the ESRF was enforced by Nordsync in 2014, the relative cost for Swedish use has therefore increased, and the amount of allocated beam-time for the other Nordsync countries has decreased. The best situation for Nordsync both in short and long term was discussed and it was concluded that this needs to be investigated further. The most attractive way, at least for Sweden, is to reduce the use of ESRF and increase the use of MAX IV. However, it is indeed very difficult to force scientists to do this. Therefore, other measures need to be discussed to accomplish a reduced total Nordsync use of the ESRF and a better balance of the Nordsync use where the relative Swedish use of the ESRF decreases and an increase for the other Nordsync countries.

§8. Vice-chair of the ESRF Council from January 1, 2021, propose candidate(s).

Present chair, Miguel Aranda, will end his term end of this year and vice-chair, Helmut Dosch, will take over as chair for ESRF from January 1st. Council will elect a vice chair, who is expected to become chairman within 2-4 years. Nordsync has the opportunity to nominate names for the position as vice chair of ESRF Council. This position has never been held by a woman before, so therefore it would be appropriate with a female nomination from Nordsync. Nordsync candidates were discussed and Norway suggested perhaps Paula but she declined the nomination. Denmark will ask Lise Aleth if she would be interested, but she recently became Dean at her institution which could rule this out. Pernille Harris from Denmark was also suggested. Ingmar will inform ESRF at the latest at the end of October if Nordsync has a nominee.

§9. Evaluation committee for the position as Administrative Director at the ESRF, propose Nordsync representative.

Present director Luis Sanchez position terminates in August 2022. The position will be opened for new candidates. Every member are welcome to propose a nominee to the search and evaluation for this position. The evaluation of candidates will take place in first half of 2021 and Nordsync should be represented by one member in the committee.

Sweden asked if Aase would be interested in being Nordsyncs representative in the evaluation committee, which Aase accepted.

§10. Discussion of the upcoming ESRF Council meeting, November 25-26, 2019. (Ingmar)

Ingmar raised the question if there is anything from Nordsync to be brought up at the next Council meeting, apart from comments on the new model for shares. Nordsync had no further comments.

§11. a/ Update on the progress of the future financing of the Swiss-Norwegian beamline (Aase)

It is has been difficult negotiations with the Suisse partners, but the Norwegian and Swiss partners has now reached an agreement for the next 4-year period, 2021-2024. There is a positive spirit for the collaboration now. The Swiss-Norwegian beam-lines (SNBL) are very important for Norwegian synchrotron based science as ca. 2/3 of the Norwegian use of the ESRF takes place at the SNBL, and 1/3 at the other beamlines.

b/ Update on the Finish interest in the DUBBLE beamline (Paula)

A bottom-up initiative by Finish scientists who organized a workshop in the beginning of June 2020, which gathered about 100 participants from Finland, the Netherlands and Belgium. There is interest in the University of Helsinki in material science as well as Åbo Akademi and Aalto University. The science case is there but financial implications means to double the Finish contribution to the ESRF. A Finnish participation in the DUBBEL beam-line should ease up the Nordsync over-use but it would in fact mean that Finland should support the Swedish use of the ESRF. More information can be found in the Annual Report from 2019.

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

Virtual user meeting has occurred with low attendance. MAX IV: 10-11 beam lines now open for users. 4-5 are under commissioning or construction and 2 more are in early stage planning. The situation at MAX IV is improving slowly. ESS going according to plan with first neutron at 2023. The construction is completed to ca.75 %, and ESS is making assessment if the pandemic will cause delays in the construction the phase is not yet official. European X-FEL: 6 instrument is up and running with only minor problems. The first scientific paper from Euro X-FEL are now published, and the facility is now running the expected user mode. Denmark has one very strong group but now it has grown to more groups as users. Swedish scientists have been very successful to receive beam-time at the Euro X-FEL both as principal investigators and collaborators.

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

Denmark: Danscatt makes strategy papers regularly with the focus on the four memberships, ESS, MAX IV, ESRF and Euro-XFEL, to ensure that Danish scientist gives appropriate training, using MAX IV and PSI. The user community has been on the rise for many years, but now it has more stabilized. The construction of MicroMAX at MAX IV has

started; MicroMAX is financed by a Danish foundation connected to the Danish company NovoNordisk.
Norway: Norscatt has taken an initiative to get a strategy on Norwegian synchrotron usage with the aim to be finished during the spring 2021.
Finland: The Synchrotron User Organization in Finland is active. Finland has allocated 90 MEuro to science as part of a Finnish restart after Corona pandemic with 20 MEuro going to research infrastructure for enhancing partnership.
Sweden: There are indications that the budget may increase for the Swedish Research Infrastructure next year and the call for national research infrastructure will be open next year.

§14. Other issues

Denmark: ESRF is synchrotron light facility producing X-rays in a wide energy range. However, the cryo EM facility at the ESRF is outside the original theme of the ESRF. Denmark starts to consider if this is a problem, and what is the view of the other Nordsync countries? Denmark wanted to make a mark that this is perhaps not how the membership should be operated. Ingmar cannot remember if the investment of the cryo-EM has been discussed in the Council. It is not clear the relationship between Instruct and this instrument. Norway think it is positive because they do not have a national cryo-EM facility. Sweden has two instruments (Stockholm and Umeå).

§15. Closing of meeting. (Ingmar)

The next annual Nordsync meeting will take place in Finland in October 2021 if the Corona pandemic has ceased.