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ACCELERATE

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State of Open Access procedures at Research Infrastructures

Summary

Open access plays a fundamental role in scientific excellence and innovation, allowing the best use of research infrastructures and the transfer of knowledge. Therefore, open access procedures need to be efficient and effective in order to ensure the scientific excellence of the research performed.

This document presents an overview of the state of the art of access procedures at research infrastructures and European networks to be used by ACCELERATE partners as a tool to develop or improve their own access procedures.

Background

Deliverable D2.1 was conceived as a report of a workgroup formed by experts from the FRM II Neutron Research Reactor operated by the Technical University of Munich and from CERIC-ERIC, in the framework of task 2.1.

Limiting the task to two partners, the content of such a report would have been limited, as well as its added value. For this reason, the Governing Board and Steering Committee of ACCELERATE decided to consult also some other projects and RIs to deliver a more comprehensive document that could reflect the existing experience in open access to research infrastructures, not only among the partners, but also in other well-established user-driven research institutions.

The deliverable was originally due in Month 3 but was postponed to Month 12 in agreement and with the approval of the responsible project officer, Patricia Postigo-McLaughlin (correspondence archived in Ares (2017) 1066027).

Importance of Open Access as a driver for scientific excellence, innovation and long-term sustainability of a Research Infrastructure

There is general agreement amongst the research community and policy makers, that open access plays a fundamental role in scientific excellence and innovation, allowing the best use of research infrastructures and the transfer of knowledge.

In 2008, the Report of the ERA Expert Group[1] highlighted open access as a key process in world class research infrastructures: "*The existence of and access to leading research infrastructures is and will remain a key determinant of Europe's competitiveness in both basic and applied research*." The same report recommended that RIs should be open to all interested researchers, based on the selection of the best proposals evaluated on their scientific excellence by international 'peer-review'. The need to establish effective access mechanisms was recognised as a priority and the expert group suggested that Large Research Infrastructures develop general

[1] Report of the ERA Expert Group - https://ec.europa.eu/research/infrastructures/pdf/ri_era-expert-group-0308_en.pdf

guidelines describing various access models, since they share some common challenges and problems.

The European Charter for Access to Research Infrastructures[2], published in 2016 by the European Commission, addresses this issue proposing non-regulatory principles and guidelines for access and related services. The charter also contains the definitions of several terms that have been used in widely different contexts (e.g. users, user access, research infrastructure) leading to some confusion. The Charter acknowledges how excellence-driven access "*enables collaborative research and technological development efforts across geographical and disciplinary boundaries*"

The Commission working document on Long-term Sustainability of Research Infrastructures[3] published in September 2017 sets the basis for an action plan, yet to be elaborated. The first part of the document shows an overview of the most important elements contributing to long-term sustainability. Ensuring scientific excellence is one of the key points. On this topic, the action plan suggests some actions for Ensuring RI in order to remain at the forefront of scientific excellence, related to access and access procedures:

1. *"Simplify and harmonise access by encouraging European RI to put in place transparent access policies, in line with the definitions, principles and guidelines of the European Charter for Access to Research Infrastructures;*
2. *Promote the "excellence-driven access mode", as defined by the Charter Access, as a requirement for funding the access to RIs;*
3. *Encourage RI to put in place multidisciplinary support mechanisms, including training modules to broaden the user base;*
4. *Whenever possible, guarantee that a share of Excellence-driven access is to be granted to the best research projects regardless of their origin and affiliation"*

Likewise, the recently published OECD policy paper "Strengthening the Effectiveness and Sustainability of Research Infrastructures"[4] defines sustainability as "the capacity for a research infrastructure to remain operative, effective and competitive over its expected lifetime" and identifies the high level of competitiveness as one of the main challenges. In particular, this refers to the development of the infrastructure but also "*ensuring reliability in terms of access and services, and assistance to users*".

[2] European charter for access to Research infrastructures - https://ec.europa.eu/research/infrastructures/pdf/2016_charterforaccessto-ris.pdf

[3] Commission working document on Long - term sustainability of Research Infrastructures - https://ec.europa.eu/research/infrastructures/pdf/swd-infrastructures_323-2017.pdf#view=fit&pagemode=none

[4] "Strengthening the effectiveness and sustainability of Research Infrastructures", OECD SCIENCE, TECHNOLOGY AND INDUSTRY - POLICY PAPERS, December 2017 No. 48

Open access has been extensively discussed and Research Infrastructures devote significant efforts to improve their procedures following the recommendations from expert groups and the feedback from users, both academic and commercial.

Existing know-how

The European Commission funded in the previous Framework programmes a number of coordination and support actions in which the core activity was providing transnational access to Research Infrastructures. However, some projects included work packages that focused on access policies aiming at the standardisation and harmonisation of procedures among similar facilities. This is a request that comes from the users' community, where users normally need to use several facilities for their research purposes and "learning" how to get access to a set of infrastructures may become challenging.
We contacted some of these projects funded during the last two programming periods (FP7 and H2020) to capitalise on their results.

Projects in FP 7

BioStruct-X

BioStruct-X brought together 19 European research organisations from 11 EU member and associated states to build a broad platform of infrastructures addressing all stages of biological structure determination, from protein production of sufficient quantity and quality for structure analysis, to sample production and data collection by a variety of X-ray methods (macromolecular crystallography, Small-Angle X-ray Scattering (SWAXS), X-ray imaging).
BioStruct-X was a successful example of access to multiple methods through a unified portal and with a centralised review panel. The portal offered a standardized proposal form (developed by the project) for submission of single projects or BAG (block application group) applications. The user could choose the facility. Facilities could choose either to accept the evaluation of BioStruct-X or propose to include these proposals in their usual review processes.
The project delivered a report (D10.2 Summary documentation on the pilot application form and data exchange protocols) but its access is restricted.
Website: https://www.biostruct-x.eu/

CALIPSO

This project comprised a consortium of 20 synchrotrons and Free-Electron Lasers. The work of standardisation and harmonisation was centred on the development of the web portal wayforlight.eu, which incorporated a database developed in a previous I3 CSA (FP6, ELISA). The database in wayforlight.org was further developed and, at present, it allows to search and compare all photon-based instruments in the EU and some outside the EU (e.g. SESAME). The web portal contains also featured scientific articles, information about calls, workshops, user surveys and other useful resources for the community. CALIPSO developed a standardised proposal form that allows to transfer a series of basic contents to all the facilities where the user wants to apply for, and specific contents are completed at the facility's user office. This multiple-

application process is made easier also by the implementation of a single sign-on software called Umbrella, which allows to login to the CALIPSO portal, as well as to all the Virtual User Offices, through a single username and password. After submission, the proposal is transferred to the selected facility and processed according to each facility's procedures (no single evaluation panel). In line with the scopes of this project, CALIPSO's user survey showed that a significant number of users asked for more standardised and transparent evaluation procedures and criteria.
CALIPSO made big steps towards standardisation and harmonisation. The main results of the project on this issue are integrating parts of the wayforlight portal.
CALIPSO Website http://www.calipso.wayforlight.eu/
WAYFORLIGHT portal http://www.wayforlight.eu/eng/home.aspx

INSTRUCT X

INSTRUCT FP7 was the preparatory phase for the present infrastructure INSTRUCT-ERIC. The main scope was to develop a pan-European infrastructure offering access and services to the Structural Biology community.
INSTRUCT offers open access to structural biology infrastructures at their INSTRUCT's Centres. The application and review process is efficient, transparent and quick, with a target turnaround time of two weeks. Applications for access can be submitted at any time. Periodically, special calls for access with specific criteria are published with a defined deadline. Each application is evaluated on its scientific merit; successful research projects should demonstrate innovative approaches within integrative structural biology. The user has the possibility to exclude reviewers that may have conflicts of interest.
The evaluation is based on four categories: 1. Scope 2. Impact 3. Preliminary Data and Risk Assessment and 4. Strengths and Weaknesses, weighted differently. The justified use of multiple instruments adds 1 point to the overall score.
Maximum score is 9. General threshold is 6/9. Below the threshold the proposal is sent back for revision by the user.
INSTRUCT also provides training, information and many other services. The infrastructure is involved in several EU projects dealing with standardisation and harmonisation. For example, the WEST-Life project, the Worldwide E-Infrastructure for structural biology, made available the deliverables related the activities of the help desk, strategy of access methods, etc.
Website: https://www.structuralbiology.eu/
West life deliverables: https://about.west-life.eu/network/west-life/about/work-packages/deliverables

IRUVX-PP

This preparatory phase was meant to create the consortium of Free electron lasers in Europe (EuroFEL). A full work package was dedicated to users: The IRUVX-PP Work Package 2 aimed, *"among other, at defining, (1) an Access Policy, and (2) tools and procedures allowing for a common, transparent and optimised user access to the distributed FEL facilities within the EuroFEL consortium"*. WP2 produced the Deliverable D2.3: Review of Access Policies and Panels. This deliverable shows a nice overview of the main characteristics of access policies in eight European large research infrastructures. Unfortunately, the deliverable is not available publicly

but any project dealing with access procedures will surely find this document very useful. In addition, an Expert's report was published called "Handbook for FEL users". This document is mainly focused on FLASH since it was the only facility in operation but reports also on proposal evaluation and includes the opinion of three experts on the advantages and drawbacks of access procedures. What emerges is that while some procedures are almost identical (call for proposals, submission, allocation of time, etc.) the main differences reside in the evaluation process. Although this WP made a good preparatory work for the harmonisation of access in FELs, developing the first "standard proposal form" that inspired a similar approach in CALIPSO, there was no convergence to a single policy for access to FELs. Nevertheless, discussions led to the development of the Umbrella system, further developed by the PanData and CRISP projects, used at present mainly by the photon community thanks to the deployment by CALIPSO.
Website: www.iruvx.eu

LASERLAB-EUROPE

The Integrated Initiative of European Laser Research Infrastructures brings together 33 leading institutions in laser-based inter-disciplinary research from 16 countries. Together with associate partners, LASERLAB-EUROPE covers the majority of European member states. 22 laboratories offer access to their facilities for research teams from Europe and beyond, kindly supported by EC funding.
One of its objectives is to offer transnational access to top-quality laser research facilities in a highly co-ordinated fashion for the benefit of the European research community. The consortium achieved this goal through the development of an access policy. The latter has only global objectives and EU resources (number of access days, total access funds) for the whole network and not for individual facilities. LASERLAB-EUROPE accounts only for 10%-20% of the beamtime available in these facilities. It must be mentioned that this project (and its predecessors in FP6 and 5, LASERNET) managed to develop from scratch an access policy and develop all the necessary tools to offer open access to facilities that traditionally did not provide it. They were the first clear example of centralised access to a distributed infrastructure, with a single entry point for users and a unique proposal review panel.
Website: https://www.laserlab-europe.eu/

NMI3

The aim of the Integrated Infrastructure Initiative for Neutron Scattering and Muon Spectroscopy (NMI3) was to facilitate the pan-European coordination of neutron scattering and muon spectroscopy research activities, by integrating all the research infrastructures in these fields within the European Research Area. NMI3 was a consortium of 18 partner organisations from 12 countries, including 8 facilities, opening the way for a more concerted, and thus more efficient, use of the existing infrastructure; the ultimate aim being a more strategic approach to future developments and increased European competitiveness in this area. In WP5 Integrated User Access a single entry point for all participating neutron facilities was developed. An 'Integrated User Access (IUA)' Networking Activity was launched to develop ideas for a framework to structure and harmonize an integrated access format to European national neutron and muon facilities for the scientific users. The project achieved to contribute to the harmonisation of access procedures in Neutron sources through these main tasks: development of a generalized

integrated user registration; harmonized proposal forms and templates; Web based proposal peer review process; platforms for cross-source independent beamtime access.
NMI3 also conducted surveys among active neutron users and neutron reviewers. One survey showed that 58% of the users would have liked that one of their rejected proposal was transferred to another facility. 42% of the users would favour a joint neutron evaluation panel while 34% would oppose to it. 24% remain uncertain. Among the reviewers only 24% would appreciate a common review panel while 28% reject the idea. The majority of 48% remains uncertain.
Website: http://nmi3.eu/

Projects in H2020

BrightnESS

The BrightnESS WP 3 "Operational Innovation" deals with the development of access policies and procedures and is still in progress.
Website: https://brightness.esss.se/

CALIPSOplus / LEAPS

The WP 3 in CALIPSOplus is working on a further harmonization of access to synchrotrons and FELs towards a more extensive deployment of the Wayforlight portal and coordinated deadlines for calls for proposals. The evaluation system remains unchanged.
The League of European Accelerator-based Photon Sources (LEAPS) initiative will set up a work group that will assist in the developments of CALIPSOplus and will discuss the possibilities of more harmonisation and transparency in the evaluation process. An attempt to form a single centralised review panel was unanimously rejected.
Website: http://www.calipsoplus.eu/

The European Cluster of Advanced Laser Light Sources (EUCALL)

EUCALL is a network of leading large-scale user facilities for free-electron laser, synchrotron and optical laser radiation and their users. Under EUCALL, they work together on their common methodologies and research opportunities, and develop tools to sustain this interaction in the future. EUCALL involves 11 partners from nine countries as well as the networks LASERLAB Europe and FELs of Europe during the project period 2015 to 2018. Regarding access procedures, EUCALL organised in 2017 the workshop User Access Policies at Advanced Laser Light Sources and Innovation Potential of Advanced Laser Light Sources that brought together representatives from many large research infrastructures and were an excellent opportunity for the exchange of good practices and procedures.
Website: https://www.eucall.eu/
Workshop User Access Policies at Advanced Laser Light Sources
Workshop Innovation Potential of Advanced Laser Light Sources

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ELITRANS

The ELITRANS WP 3 "Access" deals with the Development of the ELI-ERIC access policy, based on the principles defined by the European Charter for Access to Research Infrastructures, focusing on:

- Facilitating the Users' access to the various host sites of ELI-ERIC with their individual scientific profiles
- Guiding the Users in the selection to the scientifically most appropriate and technically relevant host facility for the specific needs expressed
- Offering state-of-the-art and sustainable access to the collected experimental data
- Harmonizing ELI's general access rules with the specific requirements for each host site of ELI-ERIC

This WP is still in progress, there are no deliverables available yet.
Website: https://eli-trans.eu/

NFFA

The NFFA project provides coordinated free and open access to an advanced distributed infrastructure to perform growth, nano-lithography, nano-characterization, theory and simulation and fine-analysis with synchrotron, FEL and neutron radiation sources. The users access includes several "installations" and is coordinated through a single entry point portal that activates an advanced user-infrastructure dialogue (Technical Liaison Network - TLNet) to build up a personalized access programme with an increasing return on science and innovation production. The TLNet tasks are the assessment on the technical feasibility of the proposals and their assignment to the best suited instruments according to their technical requirements and availability. After the TLNet evaluation, the proposal is submitted to an independent and external Access Review Panel (ARP) for the scientific evaluation. The ARP consists of twelve experts in nanoscience that cover all necessary competences foreseen by the NFFA access programme. The scientific evaluation is based on scientific merit (evaluated in terms of scientific relevance for nanoscience, appropriateness of the experimental/theoretical programme and expected impact of the results), demonstration of the need for the use of the NFFA infrastructure, innovation potential and industry interest as added value. In case of competition between projects at equal level of scientific ranking, a preference is given to projects with female proponent(s) or user groups who are new to the specific NFFA installations or are working in countries where no equivalent research infrastructure exists.

Details about their open access procedures are available in the public deliverable D1.3 Setup and implementation of the TA and evaluation procedures:
http://www.nffa.eu/outcomes/deliverables/
Website: http://www.nffa.eu

Open access procedures for scientific excellence

It is clear from this overview that the above-mentioned projects and initiatives have dealt with and are still working towards the harmonisation and/or standardisation of access procedures in research infrastructures. The European Charter for Access to Research Infrastructures made a significant contribution in this respect. Although there have been important improvements in alignment over the last ten years, some steps in the open access procedures generate resistance from facility managers. A good example is proposal evaluation. From the projects mentioned above, only NFFA and LASERLAB managed to have a centralised review panel, and facilities accept the proposals selected by these panels without further evaluation, for an amount of access time previously agreed between the facility and the project. While projects may choose to have more than one evaluation panel, this is not the case for ERICs. CERIC-ERIC started offering open access in 2014, with a first test call in March that year. Facilities declare their time commitment annually and CERIC proposals are scheduled in the Partner Facilities according to the scientific merit as established by CERIC's review panel. This is likely the approach that ELI-ERIC will adopt as a distributed facility. Although it is a single sited facility, the European Spallation Source ERIC may face a similar problem as a distributed facility, since instruments have different owners. The main condition for establishing a centralised evaluation panel is trust: facilities need to be convinced that the infrastructure or project are selecting the best proposals, since the main outputs of the infrastructure depend on it, affecting its sustainability. For this reason, we decided to focus on this critical point starting from the experience of well-established infrastructures. ACCELERATE partners will use this information for improving or establishing their evaluation procedures.

Overview of open access procedures in European Research Infrastructures

The following RIs provided information on their access procedures: ALBA, ASTRID2, DESY, Diamond Light Source, Elettra Sincrotrone Trieste, European XFEL, FELIX, HZB, ISIS, LLB – CEA, INFN-LNF (DAΦNE-Light), MLZ (for FRMII), PSI, SOLEIL Synchrotron[5]

Proprietary access (against payment) has its own procedures which are completely different from the selection based on scientific quality. With some exceptions, the scientific quality of a proprietary access project does not have any influence on the possibility to get access time. Experimental time has to be granted in a short time after the request.
As mentioned before, considering the vital importance of open access for the excellence and sustainability of the infrastructure, the information requested from the facilities regarded exclusively the access based on the scientific quality.
Most of them issue two calls for proposals per year, for short or long-term projects. This is a common practice, which reflects the compromise between the time the user has to wait from the application to the experiment and the need to have a sufficiently high number of proposals to select the best ones. Facilities offering macromolecular crystallography usually offer the

[5] For a brief description of the facilities see Annex 1, page 16

possibility of continuous submission with allocation of time shortly after the evaluation. Some have developed specific access procedures for particular experiments. As an example, SOLEIL has in addition to the regular calls, one call per year for long term projects (up to 2 years) on some of the instruments. In addition to the regular one or two calls per year, most facilities have a fast access on a limited set of beamlines.

Once the call closes, proposals go through evaluation. Most facilities perform a technical evaluation to determine the feasibility of a proposal followed by a Scientific Evaluation. In a couple of facilities, the order is inverted, or both evaluations run in parallel. In addition, a safety assessment is performed through the submission of a signed form. EUROPEAN XFEL performs the technical evaluation, the safety checks and the scientific evaluation in parallel, but the technical evaluation and safety checks must be ready at least 10 days before the meeting of the Scientific review panel, for them to take into consideration the input from the other evaluations.

The scientific evaluation process is quite similar in all the facilities; however, every facility has a singularity that makes it different from the others. Reviewers are asked to perform a scientific evaluation of the proposals assigned to them and to give a feedback assigning a score and writing comments and recommendations taking into account different relevant aspects such as innovation, quality of the research, relevance and level of potential contribution to an active field of science or an experimental technique. The process ends with a ranking of the most promising proposals that is delivered to the management of the facility. The way the ranking is created changes from one facility to another.

The evaluation criteria are established by the management of the facility according to its priorities and objectives. Although all RIs pursue scientific excellence as the main goal, some may decide to prioritise proposals in collaboration with industry, or promote young/new users, or outreach to new countries which don't have similar RIs or to consider the output of the principal investigator/group, indirectly penalising young users. This is one of the reasons why an institution may be reluctant to entrust the evaluation process to another entity (e.g. use of a single review panel). In addition to the differences in evaluation criteria, RIs adopt different procedures to select the best proposals. Some facilities (DESY, Elettra, PSI and ISIS) use a numeric rating that may vary from 0-5, 1-5 or 0-10, while others (HZB-BESSY, ASTRID2, LLB-CEA, ALBA, FELIX) use a classification according to the scheduling priority. In this scale, a letter defines the proposals to be scheduled (A, A+), the following letter defines the reserve list (B) and a third one indicates proposals that should not be scheduled (C), with slight variations amongst facilities. SOLEIL's score system is quite different from those of the other facilities, with all the members of one of the 6 review panels allowed to grade all the proposals he or she feel competent about, but only 2 or 3 referees with a spokesperson are assigned by the chairperson to give a short report on each proposal and a grade between 1 to 9 according to 4 criteria: 1-scientific interest; 2-originality; 3-clear presentation of the theme and 4-feasibility. The score given by a member of the review panel not assigned to the proposal is weighted differently. Then, the final grade is assigned during a face to face meeting. JÜLICH uses a numeric rating with proposals scored 8 or more that must get beamtime, and proposals scored 5 or less that must not get it, with a waiting list for the proposals scored between 5 and 8.

The score can be assigned to a proposal either by more reviewers or just by one and the final score decided after a plenary discussion. Evaluators are in most of the cases independent experts to avoid conflicts of interest, but some facilities prefer to have also personnel of the facility involved in the evaluation. Evaluators are commonly divided in groups according to a scientific discipline or technique. The number of these groups may change but goes from 4 to 9. The number of reviewers in each group depends on many factors; e.g. the number of required evaluations per proposal, the total number of proposals received by the facility, the number of instruments, etc. A review panel can easily contain 60-80 members, making it challenging for facilities to find such a high number of independent experts without conflict of interest, since many of them are still users of at least one facility.

After one or more evaluators have assigned a score, the final score is decided either by average or by plenary discussion. Some facilities (e.g. Elettra) apply a normalisation to the score that corrects the bias introduced by the personal preference of evaluators to use the full scale available or only a very restricted part of it. The scope of the normalisation is to make proposals' scores comparable if two or more subpanels of reviewers serve an instrument or beam-line. After each review panel meeting, the chairman produces a report for the facility management with comments, concerns and recommendations. The outcome is then used as a basis for the final allocation supervised by the facility management.

Proposals received outside the two regular annual calls frequently follow a different procedure, conditioned by the need to allow a more immediate access, for example proposals are assigned to a single evaluator or the score an average of the ones assigned by several evaluators, but there is no discussion among them.

At the end of the evaluation process, users are notified about the results of the evaluation. For those who are granted time, all the facilities require an access request that has to be approved in order for the users to enter the selected facility.

Most of the facilities have no or limited scheduling constrains mostly related to maintenance with no quotas per country. LLB-CEA has no internal research time and 75% of available time is given to the committees, whereas the rest is used for fast access, alignment, maintenance or failure proposals. Astrid2 has several two-week shutdown periods and some machine/physics/development weeks scheduled throughout the year. SOLEIL uses 65 to 80 % of the beamtime to allocate proposals submitted to the review panel, and the rest for in-house research. The EUROPEAN XFEL had previously assigned 80% of beamtime for users and the rest for maintenance or in-house research and just a small 5% for industrial users, but now they try to use 100% of the beamtime for users. ALBA and Elettra give on average 70% of the beamtime to users and the rest to commissioning or in-house research.

Open access procedures in CERIC-ERIC

One of the strengths of CERIC is to offer the possibility to submit multi-technique proposals: a user with a complex problem can ask for up to five complementary techniques with a single description of the scientific motivation (single proposal). Diversely to the conventional single instrument proposals, where the innovative approach or the full exploitation of the cutting-edge instrumentation is crucial, the score of a multi-technique proposal should reflect predominantly the importance of the scientific case. Therefore, a project with a high scientific relevance it may get time in spite of requiring a standard (not highly innovative) measurement in one of the instruments. Reviewers are asked to take into account the scientific relevance of the science behind the proposal, but also to assess whether a sophisticated facility like a synchrotron or neutron reactor is needed to achieve those results, or whether they can be achieved with conventional laboratory instruments, making the use of large scale facilities unnecessary. This dual character of the evaluation makes it difficult, and the subjectivity of reviewers can become even more pronounced.

Since CERIC was originally conceived to provide access for multi-technique proposals, the choice of the proper complementary techniques was one of the evaluation criteria. It was thus decided that the best way to reflect this was calculating the final score of the proposal as the average of the score in each instrument. The scoring scale goes from 1 (excellent, responding to all scientific relevance criteria) to 5 (unfeasible, or the use of large scale facilities is not duly justified). In the past, it was proposed to remove the instruments with worse score from consideration in the final score. It was implemented during one call but abandoned because it led to many single-instrument proposals, denaturing the scope of CERIC.

After a full year of operation, some facilities asked to extend the open access also to single instrument proposals. These facilities had instruments that were not offered to external users in open access, but just on the base of agreements between institutions, projects, etc. The inclusion of these instruments, offered also for single technique proposals but in open access based on peer review, optimised their use and increased the scientific output of these facilities. As a consequence, CERIC modified its access policy requiring as a condition multi-technique proposals for instruments that already had their own channels for open access and single or multi-technique for those instruments that offer open access only through CERIC calls. This year, in reply to the requests received by some users and the advice from the International Scientific and technical Advisory Committee (ISTAC), CERIC implemented a "fast access" pilot for some instruments. The pilot is dedicated to feasibility studies, with a maximum access time of 48 hours. It was proposed that the fast access may also extend to additional cases (e.g. macromolecular crystallography) but this option is still under consideration, since the scope of CERIC is to offer services that are complementary to the ones already offered by its participating RIs. An additional pilot, proposed to support outreach to countries with a less developed user community, was implemented in the last call. The outreach pilot foresees that scientists (potential users) are trained through targeted programs. The application for beamtime takes place through the regular calls for proposals but part of the time of the facilities is allocated preferentially to these proposals. Being a young institution, CERIC is always open to the feedback from users and suggestions from ISTAC or other experts, to improve its services.

CERIC has scheduling constrains linked to the time committed by the Representing Entities. Some infrastructures dedicate to CERIC on average 10% of the users dedicated time, while some others provide enough time to schedule 100% of the highly ranked proposals (30-40% of the user's time).

Conclusions

Open access procedures are crucial for the scientific excellence of the facility, and therefore its sustainability. A lot of progress has been made in terms of harmonisation and standardisation of access procedures in Research Infrastructures, yet there is still room for improvement. Standardisation has always proved to benefit the user's communities and resulted in a better use of resources, with LASERLAB-EUROPE being the most significant example. There are real obstacles to the harmonisation deriving from the priorities of every RI. This is reflected in the selection criteria of proposals for open access. Most of the facilities consulted have similar procedures for open access, with the exemption of the evaluation. Although it influences in a decisive way the scientific output of the facility, evaluation has not been addressed as extensively by RIs as other procedures related to open access, or at least less information is available. RIs adapt to the needs of users, incorporating new procedures such as the fast access for macromolecular crystallography. ACCELERATE partners have the possibility to consider the experience of these facilities for developing or improving their own policies and procedures.

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RIs: ALBA Synchrotron, ASTRID2, DESY, Diamond Light Source, Elettra Sincrotrone Trieste, European XFEL, FELIX, HZB, ISIS, LLB – CEA, INFN-LNF, MLZ, PSI, SOLEIL Synchrotron

Projects: BioStruct-X, BrightnESS, CALIPSO, CALIPSOplus, ELI-TRANS, EUCALL, INSTRUCT-X, IRUVX, LASERLAB Europe, NFFA, NMI3

Annex I: Brief description of the facilities consulted

Paul Scherrer Institute (PSI)

The Paul Scherrer Institute - located in Villigen/CH - is the largest research institute for natural and engineering sciences in Switzerland. The institute performs research in three main subject areas: Matter and Material, Energy and Environment, Human Health. PSI operates five large scale facilities, the Swiss Light Source (SLS) – a 3rd generation synchrotron, the spallation neutron source SINQ, the Swiss muon source SμS, a meson factory for particle physics and the X-ray free electron laser facility SwissFEL, which just started pilot user operation by the end of 2017. All PSI user facilities offer open access to external academic and industrial users worldwide via one single entry point, operated by the PSI User Office.
https://www.psi.ch

Istituto Nazionale di Fisica – Laboratori Nazionali di Frascati (LNF.INFN)

INFN is the Italian National Institute for the study of Nuclear and Sub-nuclear Physics with accelerators and the Frascati National Laboratory (LNF) is the largest INFN laboratory. INFN-LNF operates the DAΦNE storage ring and DAΦNE - Light synchrotron radiation facility with three operational beamlines and two under commissioning.
http://w3.lnf.infn.it

Laboratoire Léon Brillouin (LLB – CEA)

The French Laboratoire Léon Brilloin uses neutron beams produced by the Orphée research reactor to perform neutron scattering experiments for fundamental and applied research. The scientific activities of the laboratory can be classified in three fields: physical-chemistry, structural and phase transition studies, magnetism and superconductivity.
http://www-llb.cea.fr

Soleil Synchrotron (SOLEIL)

SOLEIL is the French National Synchrotron Light Source to matter analysis down to the atomic scale. SOLEIL's 29 Beamlines cover fundamental research needs in physics, chemistry, material sciences, life sciences, earth sciences, and atmospheric sciences. It offers the use of a wide range of spectroscopic methods from infrared to X-rays, and structural methods such as X-ray diffraction and diffusion.
https://www.synchrotron-soleil.fr

ASTRID2

ASTRID2 at the Department of Physics and Astronomy, Aarhus University, Denmark, is a low energy synchrotron light source used for research within medicine, molecular and cell biology, nanotechnology and atomic and molecular physics. A wide range of spectroscopic methods from the infrared to soft x-rays are used across the 6 beam lines, with access to the facilities available to academic and industrial users worldwide.
www.isa.au.dk

Alba Synchrotron (ALBA)

ALBA is a Synchrotron Light facility located near Barcelona/Spain with a complex of electron accelerators which allows the visualization of the atomic structure of matter as well as the study of its properties. The facility has eight operational beamlines comprising soft and hard X-rays, devoted to biosciences, condensed matter (magnetic and electronic properties, nanoscience) and materials science.
https://www.cells.es

Deutsches Elektronen-Synchrotron (DESY)

DESY is a world's leading accelerator centre for the research of interactions of tiny elementary particles and the behaviour of new types of nanomaterials to biomolecular processes. The in Germany located facility offers a wide range of X-rays instruments through three large accelerators: PETRA III, FLASH and as international project EUROPEAN XFEL.
http://www.desy.de

Helmholtz Zentrum Berlin (HZB)

The HZB facility in Germany conduct research on complex systems of materials. The BESSY II photon source in Berlin-Adlershof with its 46 beamlines is highly suited for analysing thin-film materials. With its emphasis on vacuum ultraviolet radiations (VUV) and soft X-ray emissions, it offers ideal capabilities for investigating thin films as well as boundary surfaces. Further the HZB operates the BER II neutron reactor located in Berlin-Wannsee. The BER II comprises 9 different neutron instruments.
https://www.helmholtz-berlin.de

European XFEL

The construction and operation of the European XFEL facility has been entrusted to a non-profit limited liability company under German law, the European X-Ray Free-Electron Laser Facility GmbH (European XFEL GmbH), that has international shareholders. The shareholders are designated by the governments of the international partners who commit themselves in an intergovernmental convention to support the construction and operation of the European XFEL. Denmark, France, Germany, Hungary, Italy, Poland, Russia, Slovakia, Spain, Sweden, and Switzerland participated in the construction and operation of the European XFEL. The United Kingdom is in the process of joining as the twelfth member state. The Facility is based in Schenefeld, Germany.
Research currently being done at X-ray FELs is already breaking new ground, with studies across many disciplines: determining structures of molecules critical to biology, watching ultrafast energy transfers within molecules, probing the characteristics of extreme states of matter, and observing the behaviour of electrons within complex molecules. The European XFEL started Early User operation in September 2017 and with its special characteristics of ultrashort pulses and ultrahigh brilliance, it is expected that new opportunities in many areas of research will be created.
https://www.xfel.eu

FELIX Laboratory

The FELIX Laboratory at Radboud University in the Netherlands exploits intense, short-pulsed infrared and THz free electron lasers that are used for research of matter both by in-house as well as national and international external users. The four lasers FELIX-1, FELIX-2, FELICE and FLARE each produce their own range of wavelengths and together, they provide a tuning range between 3 and 1500 µm.

http://www.ru.nl/felix/

DIAMOND Light Source

The DIAMOND Light Source is the UK's national third-generation synchrotron located at the Harwell Science and Innovation Campus in Oxfordshire that has been designed to produce very intense beams of X-rays, infrared and ultraviolet light. The facility provides a medium energy source supporting a very wide range of applications. The synchrotron is free at the point of access through a competitive application process, provided that the results are in the public domain.

http://www.diamond.ac.uk/Home.html

ISIS Neutron and Muon Source

ISIS Neutron and Muon Source is based at the STFC Rutherford Appleton Laboratory in Oxfordshire and is a world-leading centre for research in the physical and life sciences. With over 30 neutron and muon instruments the ISIS allows an international community of more than 3000 scientists to study materials at the atomic level

https://www.isis.stfc.ac.uk

JÜLICH Forschungszentrum

The JÜLICH Forschungszentrum is a German located interdisciplinary research institution and member of the Helmholtz Association. JÜLICH has ten research institutes with over 60 sub-institutes working in the areas of energy and climate research, bio- and geosciences, medicine and neuroscience, complex systems, simulation science, and nanotechnology.

http://www.fz-juelich.de