Project No. FP7 – 212348

NFFA
Nanoscience Foundries and Fine Analysis

D 4.4
Users Access Scheme

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Deliverable D4.4: Users Access Scheme

1. INTRODUCTION

1.1. Purpose of the document

The purpose of this document is to outline briefly the process by which users will be granted access to the NFFA infrastructure.

1.2. Application Area

Targets of this document are the members of the NFFA Project and the EC Project Officers.

1.3. References

Description of Work (DoW). See at web site:
http://www.nffa.eu/UserFiles/file/Annex_I_DoW.pdf

1.3.1. Objective of Work Package 4

The main objectives of WP4 are to define the mission and the general structure of the future NFFA-RI, including general management of the central RI and of the local facilities, set quality standards of production, develop schemes for implementing a NFFA-RI repository of data and protocols and to make it available to the general users. Last, but not least, to define a flexible and efficient users' access.

1.3.2. Description of work broken down into tasks

This deliverable concerns mainly to the task 4.4 defined in WP4 as:

T4.4) Develop a robust scheme for the access by users to the NFFA-RI Centres and to the NFFA-RI Data Repository. Multiple modes of work at/with NFFA-RI will be described. Users will have quality of direct operators of the facilities, or of clients of the facilities, or of trainees at the facilities, according to expertise and effective need/possibility. Remote access to some NFFA-RI facilities will also be evaluated and implemented as a possibility. Rules of access to the NFFA-RI Repository. Issues of intellectual property of NFFA products.

2. EXECUTIVE SUMMARY

The core of the user access scheme is formed by the triplet of issues: 'type of users', 'type of access', and 'proposal reviewing'

It is impossible to find a 'one fits all' approach for any of those issues, so we have to try to build some flexibility in the different schemes without losing transparency in the procedures.

The 'type of users' issue covers the different users' profiles welcome to NFFA operation and the type of research they can perform: proprietary and, most commonly, non-proprietary.

The 'type of access' issue covers the different ways granted users can access the 'stuff and staff' made available to them. While a hands on approach will be advantageous in most cases, supervised access will be advisable in others regarding costly and more involving equipment. Cases where users will not need to be personally present at NFFA are also considered.

The last point relates to the definite routes the different users type has to follow to get their proposal granted: the 'proposal reviewing' procedures. The standard procedure should involve different steps: a technical in-house viability check, an external scientific quality check, ranking and resource allocation. Shortcuts to this procedure may be considered for specific types of users and/or proposals without exceeding a maximum total allocation to be defined.

The main goal of NFFA is to enable **high quality** short and long term research activities **on a free basis**, preferably in collaboration with NFFA in-house scientific staff, and preferably involving the capabilities of neighbouring LSFs. The existent NFFA nano capabilities can be also made available **for a fee** to a certain (non significant - to be defined) extent as a technological service to the scientific and industrial community.

The final implementation of the access of users will impact other managerial aspects of NFFA such as the user agreements to be prepared, the repository feeding and access policies, and the training schemes to be run at NFFA sites.

3. BACKGROUND

The goal of the whole NFFA exercise is to provide efficient open access to nanoscience and nanotechnology infrastructure and to the available fine analysis large infrastructures (synchrotrons, high power lasers and FELs, neutron sources) to users from scientific institutions and industry. In this way, good ideas, and not the economical power of scientific groups, will be the limiting factor of nanotechnology progress. NFFA will organize itself as a distributed pan-European facility with a unique access portal.

A few previous deliverables have punctually considered aspects related to NFFA user access, namely:

- D2.4 Industrial Liaison Office for NFFA-RI
- D3.1 Design of a NFFA Infrastructure
- D4.1 Mission Statement of NFFA-RI
- D5.1 Scheme for Training Lessons for NFFA Staff

The present document offers a global approach to the users' access issues while being consistent with what has already been written and delivered. As shown in Fig. 1, the triplet of issues: 'type of users', 'type of access', and 'proposal reviewing' is identified as being the core of the user based NFFA operation, and next sections are devoted to describe such issues.

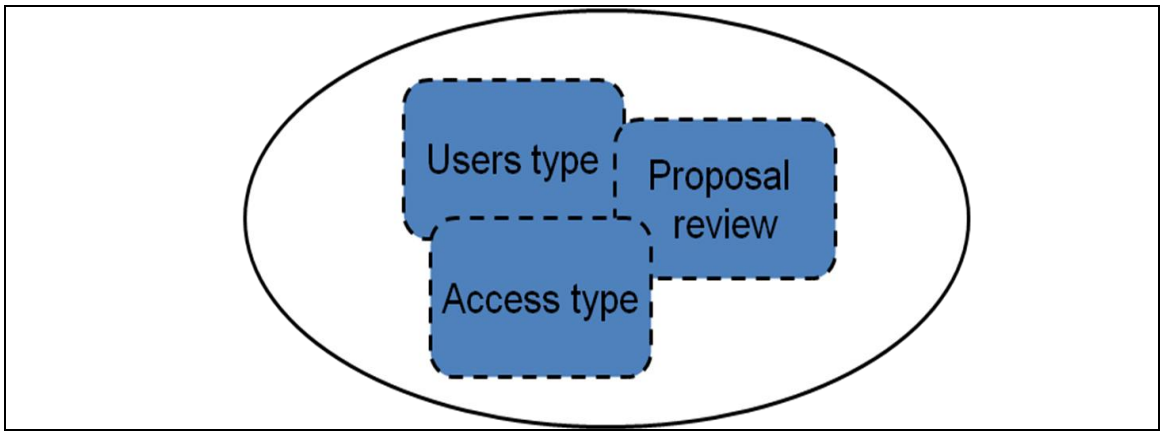

Fig. 1 Core of user based NFFA operation

The ideas and concepts contained in this document are based on the previous experience of the partners, on the inputs gathered from the visits to the USA DOE centres, on common practices of other

infrastructure and initiatives, and on the ERF conference on future access of EU Research Infrastructures, and on the results of workshop organized by WP4.

4. TYPE OF USERS

The 'type of users' issue covers the different users welcome to NFFA operation and the type of research they can perform (Fig. 2).

NFFA will mainly support **non-proprietary** research performed by **academies, public research institutions, service providers and industrial laboratories.** Such support will be offered essentially on a free basis, according to the **"open access"** protocol. **Proprietary** research coming from industrial users looking for a competitive advantage will also be considered to a limited extent. Such an option will be covered by a different user agreement contract in relation to cost and intellectual properties issues.

In addition to individual academic and industrial users, a third type of users may be considered, namely, **pre-qualified collectives**. NFFA will reach an agreement with those collectives, which should be stable and well structured, by which they will have free batch allocation of NFFA resources under a peer reviewed program of activities with own internal management (BAG –beamtime allocation group- model). This BAG program will have a definite duration in time, and will be peer reviewed at the beginning, at mid-term if relevant, and a-posteriori. The overall amount of NFFA resources devoted to BAGS will be carefully balanced with respect to standard users pressure and confirmed/extended only if fully competitive in terms of science results. In a way, this approach mimics the block allocation group approach that NFFA itself will establish as a possible access to the resources of the neighbouring LSF.

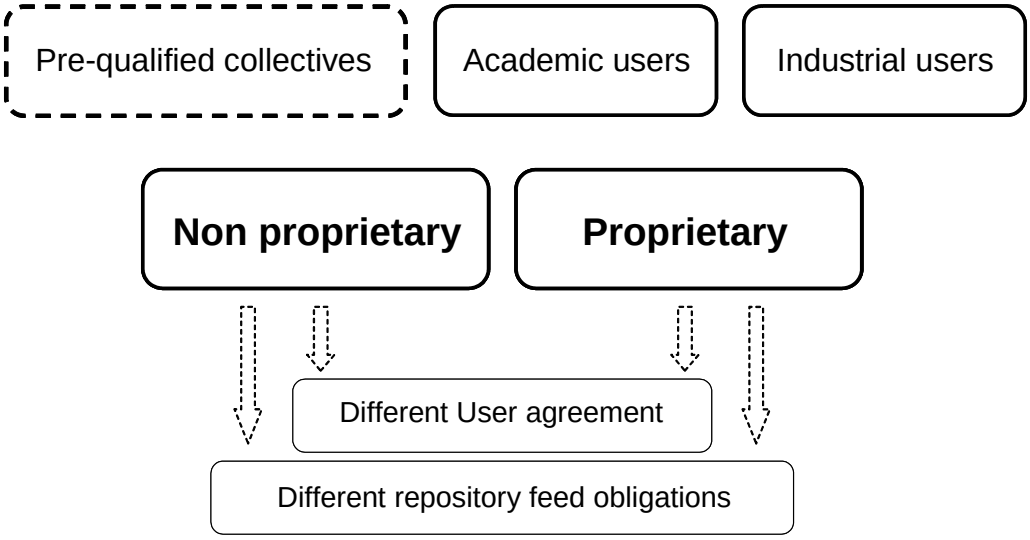

Fig. 2. Types of external user and of research

From a generic point of view the NFFA infrastructure will therefore be used by a variety of users:

1. **NFFA staff** performing non-proprietary in-house research within the established quotas and according to the in-house scientific programme monitored by NFFA Scientific Advisory Committee.
2. **External users** (whether academic or industrial) performing **non-proprietary research**. This will use the majority of the available NFFA time. These users submit proposals to NFFA, describing the details of the experiment. All proposals are evaluated (IUPAP rules) by a proposal review

committee and ranked against competing proposals in terms of scientific merit. Successful proposals are given NFFA access time free of charge. The results of the experiments, done during the allocated access time, are expected to be published in due time in peer reviewed scientific journals, and original data and metadata will be requested to be stored appropriately to be available for open access, after a period of time (EU indications).

3. **Groups pre-qualified** via peer review as BAG users (block access groups) performing research under the same conditions than group 2. Their access will be managed by their own within the quotas attributed to the BAG by the Scientific Advisory Committee.
4. **Users performing proprietary research**. This will suppose a minor part of the experiments. Here users can make a contract with NFFA (depending on the internal NFFA agreements) for performing experiments on which they want to have a non-disclosure agreement (non peer reviewed and/or for commercial use). They must cover the full costs of the NFFA access time and have no obligation to publish the results. Efforts will be made to secure appropriate intellectual property control for proprietary users.
5. Users having punctual access to NFFA resources (technological processes and characterization techniques) as a **paid technological service**, not in the form of a research proposal
6. **Trainees** of NFFA courses and PhD programmes in collaboration with external academic/research institutions.
7. Users who demand access to the NFFA **Data Public Repository**. Such access will be regulated according to the relevant NFFA policy on data management and storage. The access to NFFA Data Repository will define a new category of users with appropriate rules and restrictions.

Users may in part access in a non-presential/remote manner, as a function of the implementation of adequate access modes to NFFA methods and instruments (standardized process steps, codes, facilities).

5. TYPE OF ACCESS

5.1. Open access (free of charge)

The 'type of access' issue covers the different ways granted users can access the 'stuff and staff' made available to them. These ways differ in the extent the users will be involved themselves in the operation of the material resources of NFFA. This degree of involvement will not be the result of the user desire: NFFA technical managers will decide which pieces of equipment and under which circumstances will be operated by an unsupervised user. The users will be provided accordingly with different levels of information and/or training/qualification.

The different modes considered can be seen in Fig. 3a, and here follow the concepts underpinning them:

[Presential] In this case, the users will be present in NFFA premises when their projects are being developed. They will have a '**hands off'** access, though, to those machines that are considered too critical to be operated under a self service mode. They may be present during the process (they may be required to, as well) accompanying and assisting the staff operator in charge of those pieces of equipment. For those machines opened to a certain degree of self service, the user will follow a **'hands on'** approach. It could be an '**open hands on'** approach for the equipment that is considered appropriate to be used punctually by users with a minimum training, or a **'limited hands on'** approach for those more complex machines that require a more in depth training that will only be provided to users that credit the need of an intensive and prolonged use of such equipment or to known experts.

The **hands on/hands off** approach is a mixed approach involving both the machines being used and the users. The label of **hands on/hands off** is first set *at machine-level* according to the criteria of NFFA technical staff considering the complexity of the associated training and the potential consequences of misuse. Then a second *user-level* consideration may modify the '**hands off'** label to a '**limited open**' label attending special needs of some users. These will be considered case by case. Anyway, the purpose is to maximize the number of hands on machines made available to presential users provided their use is sound and safe. NFFA training of users will be offered and passing tests will be required in order to access in safe and productive conditions all the infrastructure.

[Non-presential/remote] In this type of access, the user does not travel to the NFFA centre and does not get involved physically with the development of the project. The user defines a sequence of standard steps from an established set available at the NFFA site and the work is done by NFFA staff. This is not the most common access type expected in the NFFA environment, especially at the onset of the NFFA process, since for it to be meaningful established technologies with a pool of well characterized steps, from which a innovative project could be constructed, must be developed first.

[e-access] Similarly to the remote case above, this type of access does not involve physical travelling to the NFFA site. In this case, it refers to the on-line access to computer based tools (simulation, modelling…) and resources (data repository) that will be progressively developed at the NFFA centres. Even for activities involving physical samples, a mixed type access (some presential workers and more being "on line" at their home institutions) may become a very effective work style provided broad band and remote control tools are developed, as it is planned for many activities of the NFFA centres.

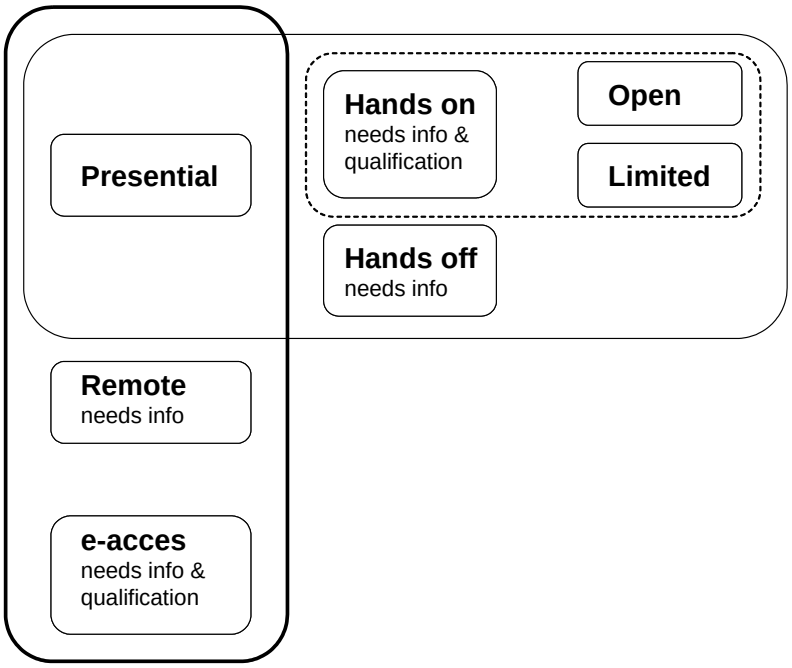

Fig. 3a Types of free research access to NFFA facilities

5.2. Service aspects

The goal of NFFA is to enable short and long term peer reviewed research activities of quality on a free-of-charge basis. Often this will turn out to imply collaboration with NFFA in-house scientific staff and with the NFFA and facility scientists preferably involving the capabilities of the neighbouring LSFs. Nevertheless, the existent NFFA nano capabilities can be made available to a certain extent as a technological service for a fee to the scientific and industrial community (Fig. 3b).

A desk service managed by the Technical Liaison will be available in each NFFA centre. It will provide a quick response for short (few hours) technological demands (for instance sample characterization or preparation in a standard and well established way) monitored at NFFA central level, but directly managed at local level.

The common metrology and protocols strategy and the data repository will be effective in exchanging data and procedures between laboratories and NFFA centres and in upgrading the service itself.

Routinely, services will be of non-presential nature, or hands off presential. Services that require any hands on presential access to the NFFA infrastructure will be specifically negotiated.

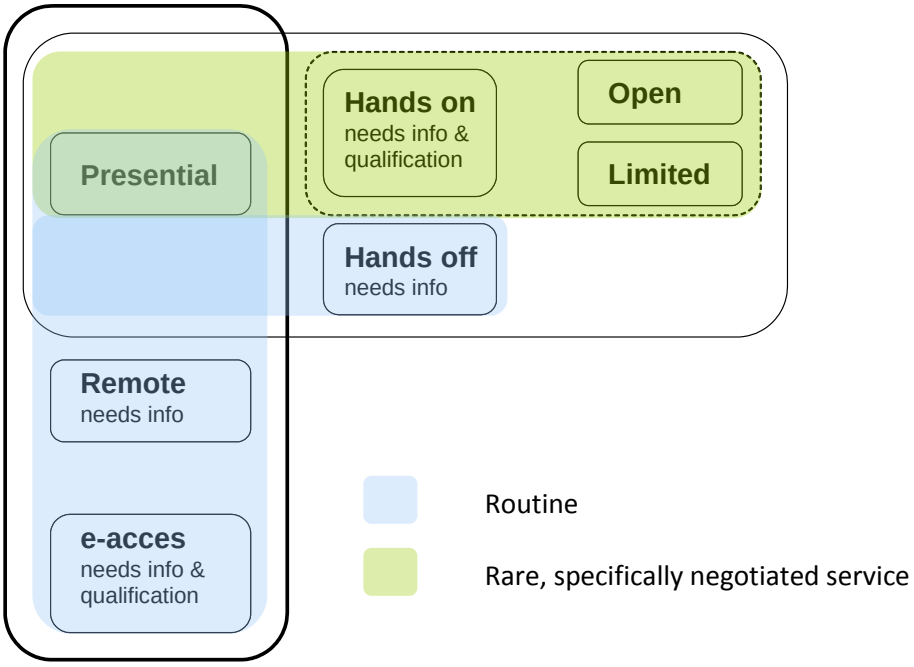

Fig. 3b Types of service-for-a-fee access to NFFA facilities

Another important role of the Technical Liaison with connection to the access of users is offering support to inexperienced users (not only, but particularly to industries) in the proposal application stage. This support can even be extended to a pre-proposal stage where the users may address to the Technical Liaison an idea of a proposal as a competence support request.

6. REVIEW PROCEDURE

In addition to the access modes, the access NFFA governance has to define by which route the different user types get their proposal approved (Fig.4). This last point relates to the 'proposal reviewing' procedures.

While for the 'type of users' and 'type of access' just a few decisions are needed to settle a model, for the 'proposal reviewing' a lot of practicalities have to be sorted out:

- continuous open call vs. periodic calls (number and duration of them…)
- optimal number of reviewers per proposal
- setting a reviewer fee
- length of the proposal form

Different user oriented initiatives use different approaches worldwide. Many of them have been analyzed and the results regarding access are included in the SWOT analysis of D4.1. In the context of proposal submission and reviewing, several time-entry points and a fast reviewing process will be favoured at the initial stages of NFFA. Yearly, four calls for short projects and two for long projects are therefore considered. A reviewer fee may be initially implemented for achieving the commitment and fast response of reviewers. This measure can be revised after a few calls. At least three reviewers per proposal will be appointed. A team of few panellists may be selected at the beginning of NFFA, but after a few iterations a wider pool of them including former users will be available. Using a panellist repeatedly in time is something that will be avoided.

Proposal forms also vary across the world. Short forms, with just enough description to evaluate feasibility and scientific merit, will be favoured at the onset of NFFA. Practice will dictate if such forms will need revision. Confidentiality issues regarding reviewers and NFFA staff will be taken care of. Every proposal will be registered to assist users in demonstrating when an original idea was made available by them, thus securing their trust in the NFFA system. Once a proposal becomes a project, a user agreement will be signed specifying rights and duties of each part.

One last point to be considered is that one of the primary goals of NFFA is that as many of the proposals as possible make use of both the NFFA nanolabs and the neighbouring LSF. For that reason personnel of the LSF should be involved in the feasibility checks when needed, and LSF experts should be routinely included in the panellists pool.

The standard reviewing procedure will involve the following different steps:

- A fast technical in-house viability check,
- An external quality check leading to a proposal ranking. By quality, scientific interest and relevance is meant

This process will lead to the acceptance of a given number of proposal based on resources availability, and the preparation of a work flow for them.

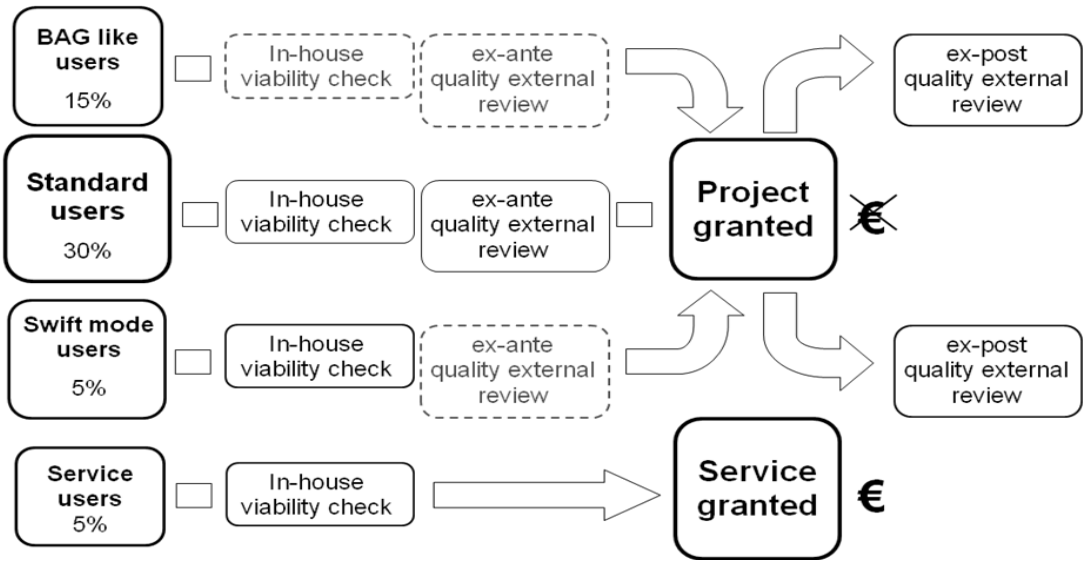

Fig. 4a User Proposal review scheme (The percentages are tentative resources usage devoted to the different type of users)

For the sake of flexibility, shortcuts to this procedure may be considered for specific types of users and/or proposals without exceeding a maximum total allocation to be defined (Fig. 4). Possible examples are urgent proposals that are considered interesting enough not to wait for the next open call (swift access

mode). Similarly, strategic agreements with some parties involving a more generic program of activities (going beyond short and long projects) may be considered (the previously introduced 'pre-qualified collectives' or BAG users). In those cases a post quality check of periodic nature may be set in place to assure that the criteria of NFFA when agreeing to those special access routes is periodically externally evaluated.

A report should be filed by the user at the end of the project. A local NFFA committee will review those reports. They will work both ways: the user will be asked about his satisfaction, and conversely NFFA will check that the user team has made proper and efficient use of the resources made available to them. Long projects may be subjected to intermediate reporting. The primary purpose of such process is not advising for the discontinuation of a long project, or advising against a potential continuation of a short project or a second independent proposal of the same user (although serious 'misbehaviour' could lead to those consequences) but to improve NFFA operation and to assure that the resources are used profitably. Panellists involved at the proposal stage may be invited (anonymously) to these intermediate and final reviews.

Indicative partition figures among different type of external users are also shown in Fig. 4. The addition of all NFFA usage percentages devoted to external users should account for at least half of the total NFFA resources. The tentative percentages shown in Fig. 4a add to 55%. The rest of resources usage corresponds to a 5% of duty cycle (maintenance and common metrology tasks) and a 40% of usage linked to the realization of the in-house scientific program by the NFFA staff as shown in Fig. 4b. All numerical percentages are indicative. Practice will dictate how they will evolve.

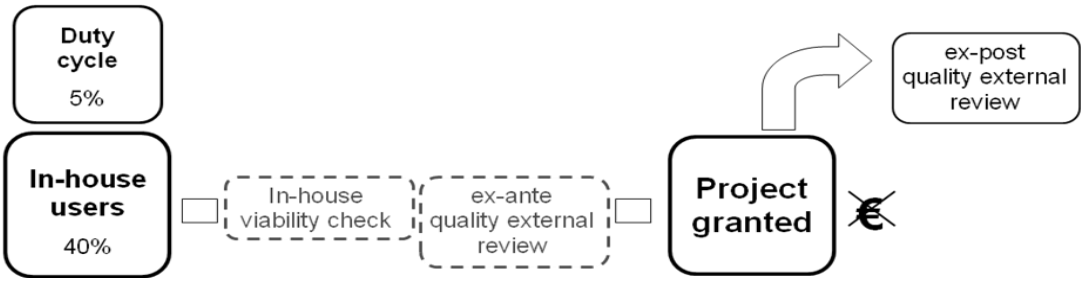

Fig. 4b In house use of NFFA resources

For the reviewing of NFFA own projects, NFFA staff can be considered a special case of 'pre-qualified' BAG collective, and the quality of those projects will be evaluated ex-post by the Scientific Advisory Committee that will also guide the research ex-ante by monitoring the NFFA Scientific Programme.

7. OTHER ASPECTS

When deciding the basics of the mode of operation of NFFA in relation to user access, we have to take into account two important trademarks of the proposed model:

- NFFA will have a unique entry portal of proposals. The final allocation of the proposals after the reviewing process will consider first the thematic alignment with the distinct science programs of the NFFA sites and the specificity of the tools required that may be only available at particular NFFA/LSF environments. The allocation of those proposals for which such considerations are not an issue, will take into account other practicalities such as the current availability of NFFA resources at the different sites and the geographical proximity of the applicants. Users will be asked if they have preferences and arguments to support them.

- NFFA will interact with LSFs in those cases the proposals involve their infrastructure in addition to the NFFA one. How this fact will impact the reviewing process shall be carefully considered. Pre-arrangements with LSFs are desirable. Periodic revisions of those arrangements will help fine tuning this important process.

The final implementation of the access of users will impact other managerial aspects of NFFA such as

- the user agreements to be prepared and the repository feeding obligations, which will differ in case the research performed is proprietary or non-proprietary
- the training schemes for users, ranging from mere information about techniques/processes to in depth training/qualification, depending on the hands off/hands on nature of their involvement.

Finally, the fullness of the societal impact of nanotechnology can only be attained if such knowledge finds its way appropriately into public awareness and especially industrial innovation. NFFA will contribute to this goal by establishing and refining an access scheme for industrial users. The Industrial Liaison Office, which is part of the Technical Liaison, will take charge of easing industrial participation in non proprietary and proprietary research. The common metrology and protocols strategy and the data repository will be effective in achieving that level of quality in terms of reproducibility and transferability of results that the industrial community usually asks for from scientific infrastructures

8. DATA MANAGEMENT

The whole activity of NFFA will progressively be managed and recorded by the Data Management System that will start a new entry as a new proposal is submitted, and start a new full protocol as a new proposal is accepted for access. The submitted proposals will provide information on users demand (quantity and quality), users institutions, themes of research, and will determine the overbooking ratio.

The accepted proposals will trigger the opening of a complex metadata and data system, transparent to the users, in which all relevant background information will be inserted as well as all data and metadata produced at NFFA and all relevant data analysis leading to results and to storing into the NFFA repository of the useful information. This is described in D4.9. The “entry point” in the NFFA will be in fact the entry in the NFFA data system, centralized but equally visible in all NFFA centres and in all the NFFA central and local web-sites.

9. CONCLUSIONS

The primary scientific task of NFFA is to perform top-level non-proprietary science in an open access mode, regulated by a peer review following the scientific/technological merit criterion for both public and private institutions, pointing toward atomic precision manufacturing. Proprietary research is not excluded, but its research quote has anyway to be limited to an adequate level in order to keep a high scientific profile.

The effective open access for both short and long-term proposals by academic and industrial researchers assisted, when needed, by highly qualified staff, composed of scientists and engineers, is one of the cornerstones of the NFFA approach. Apart from human and technical resources, open access to the Data Repository that will be built upon continuous NFFA operation is another important part of the overall offer of the NFFA research infrastructure.

This deliverable offers a generic picture of the different user scenarios that a NFFA centre may face in the future. However not every possibility needs to be set up at the onset of NFFA operation, when the priority will be properly balancing the technological offer and the scientific demand. Some of the possible access modes can be part of a learning curve, but it is interesting that NFFA management considers in advance all eventual possibilities in an attempt of providing an efficient support to the widest possible

nanotechnology community. It is equally advisable that the NFFA operation has some built-in flexibility and autonomy in order to smooth daily operation. NFFA management should be able, for instance, to decide about the in-house science and training programs, the appropriateness of the service access mode and swift access mode projects and the time quotas devoted to them, or the possibility of BAG users. This does not mean that these decisions will remain unsupervised, but that they will follow some ex-post quality revisions, in some cases linked to the periodical reviews of the NFFA performance itself.

In the context of NFFA users can be broadly defined as researchers interested in using the NFFA consortium facilities for their science and innovation work. Generally users will come in person to the facilities to perform their experiments. However, increasingly users may participate in experiments at the facilities via remote access to the local resources, when the local technical support system is developed for this mode of operation.

There are seven basic classes of user activity orientations:

1. Non-proprietary in-house research by NFFA staff within the established quotas and according to the in-house scientific programme monitored by NFFA Scientific Advisory Committee.
2. Non-proprietary research by external users. These users submit proposals to NFFA, describing the details of the experiment. All proposals are evaluated by a proposal review committee and ranked against competing proposals. Successful proposals are given NFFA access time free of charge. The results of the experiments, done during the allocated access time, are expected to be published in due time in peer reviewed scientific journals, and original data and metadata will be requested to be stored appropriately to be available for open access, after a period of time (EU indications).
3. Groups pre-qualified via peer review as BAG users (block access groups) will perform research under the same conditions as group 2. But with its own access management within the quotas attributed to the BAG by the Scientific Advisory Committee
4. Proprietary research: this is the minor part of the experiments. Here users can make a contract with NFFA (depending on the internal NFFA agreements) for performing experiments on which they want to have a non-disclosure agreement (peer reviewed and/or for commercial use). They must cover the full costs of the NFFA access time and have no obligation to publish the results. Efforts will be made to secure appropriate intellectual property control for proprietary users.
5. Users accessing NFFA for punctual paid technological services.
6. Trainees of NFFA courses and PhD programmes in collaboration with external academic/research institutions.
7. Users who demand access to the NFFA Data Public Repository. Such access will be regulated according to the relevant NFFA policy on data management and storage. The access to NFFA Data Repository will define a new category of users with appropriate rules and restrictions.

For the more normal of the external user access mode, the access steps will be the following:

1. Idea submission (optional, addressed to the Technical Liaison)
2. Proposal submission (stating also a preferred time scheduling and preferred NFFA centre)
3. Technical feasibility (quick in-house response)
4. Scientific review (periodical, a few times a year)
5. NFFA decision on acceptance (preparation of a work flow)
6. User acceptance of workflow and scheduling

For other more specific access modes depending on user type, shortcuts and alternatives paths to the above procedure have been described in the deliverable.