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DELIVERABLE REPORT

WP2 - MGT2 - Pilot scheme for the management of a distributed research infrastructure offering harmonised, interoperable and integrated services

D2.4

First call for additional providers

Due date

M24



This initiative has received funding from the EU's H2020 framework program for research and innovation under grant agreement n. 101007417, NFFA-Europe Pilot Project

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Cristina Africh (CNR)

DELIVERABLE DETAILS

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First call for additional providers

DELIVERABLE DESCRIPTION

The report describes the analysis of the needs of the TA programme behind the launch of the first call for additional providers. This action is foreseen by the Grant Agreement to be carried out at M24

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AUTHORS

Elisabetta Travaglia (CNR), Cristina Africh (CNR), Luis Fonseca (CSIC), Laura Esposito (CNR), Emmanuel Stratakis (FORTH), Giuseppe Piero Brandino (eXact lab), Giorgio Rossi (UniMI), Roberto Gotter (CNR)

PERSON RESPONSIBLE FOR THE DELIVERABLE

Cristina Africh (CNR)



NATURE

- R - Report
- P - Prototype
- DEC - Websites, Patent filing, Press & media actions, Videos, etc
- O - Other

DISSEMINATION LEVEL

- P - Public
- PP - Restricted to other programme participants & EC: (Specify)
- RE - Restricted to a group (Specify)
- CO - Confidential, only for members of the consortium

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FOR MORE INFO PLEASE CONTACT

Dr. Cristina Africh (CNR)

email: cristina.africh@nffa.eu

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Introduction

According to the Grant Agreement, in the lifetime of NFFA-Europe Pilot the Transnational Access offer must enlarge to meet (i) the qualitative needs of users that could be better met with new specialized providers, or (ii) quantitative needs resulting in oversubscription of the current capacity. To this aim, two calls for additional access providers were foreseen at M24 and M40, respectively. This report describes the rationale that led to the text of the first call for additional access providers, i.e. from the evaluation of the needs – mainly based on the analysis provided in the deliverable D2.3 "First balance of access provision" - to the search for alternative solutions to widen and strengthen the current offer.

Route towards the definition of the call for new access providers

The enlargement of the transnational access offer through the addition of new access providers is a specific action envisaged by the Grant Agreement.

A whole task (task 2.5) is totally devoted to analysing, suggesting and monitoring the technical and scientific evolution of the IDRIN (Interoperable Distributed Research Infrastructure for Nanoscience). As a result, the activity of task 2.5 includes the launch of two Call for new providers as stated in the GA:

"Task 2.5 will prepare the calls for new providers at month 24 and month 40, to be discussed and approved at ESC level. The call profile will be defined upon analysis of usage in collaboration with the TLNet (absorption of UoAs in different INSTALLATIONS and individual instruments) and identification of qualitative needs by users that could be better met with new specialized providers, or quantitative needs resulting in oversubscription of the current capacity. The call criteria will define new providers along the same possible profiles of beneficiaries, linked Third Parties of beneficiaries, TPAP or subcontractors. The selection of the responses to the call will be assessed by the ESC upon advice of the TLNet, of the UA-ACB and of the Experts of Landscape and LTS. A priority list will be



established and submitted for approval by the GeAs who asks for an amendment to the Grant Agreement to include the new provider/s to the NEP.”

As clearly stated in the description of the task, the call for new access providers must respond to two key needs: the compensation of a lack of capacity of specific techniques/tools and the addition of complementary techniques to better satisfy the users' needs. Additional consideration has been put around the industrial needs, in order to meet also their special demand.

The main steps that brought to the draft and launch of the call for new providers are briefly listed here below and described in details in the next sections:

- Evaluation of the use of the installations, the use of the overall infrastructure and the identification of the criticalities and priorities for the strengthening of the offer. From the analysis of the access consumption for each distributed installation (D3.1, D4.1, D5.1, D6.1, D7.1, D8.1) and the overall assessment of access in the first four calls for users' proposals (D2.3), it has been possible to identify the main criticalities, in particular in terms of oversaturation of specific techniques.

- Discussion on the needs. Different issues at different levels have been considered to appraise the infrastructure needs and goals: the appropriateness of extending the user community, the search of solutions internally to the current consortium, the neutron facilities situation.

- Survey among users. To complement the “infrastructure point of view” it was decided to consult the users in order to gain insight on the needs of the direct beneficiaries of the infrastructure main activity.

- Analysis of spontaneous expressions of interest to become NFFA-Europe access providers. During the course of the project, different organizations, both public and private, expressed their interest in becoming NFFA-Europe providers.

- Analysis of the needs of industrial partners. In order to have a complete overview of all potential users, companies that expressed their interest in NFFA were asked to give their opinion about our different activities.

- Final decisions, call writing and launch of the call. After having considered all the abovementioned aspects, the ESC decided to launch a call to compensate the criticalities of the current offer, with a special invitation to the industrial realities. Details such as deadline, dissemination actions and role of the additional access providers within the Consortium, have been agreed at ESC level.

Evaluation of Transnational Access request and consumption

Six deliverables (one for each TA installation - D3.1, D4.1, D5.1, D6.1, D7.1, D8.1) on the “Transnational Access Provision first balance” have been submitted in November 2022; beyond the description of the techniques present in each installation and the providers involved, they contained an analysis of the access provision during the first reporting period (i.e. access performed in call 1-3 and access requested in call 4) and the potential perspectives of widening the offer of each installation. The deliverable “First assessment of access provision” was drafted from these analyses and from a more scientific outlook on the user activity; its main aim was to analyse the demand, the use of the IDRIN and its potential developments. The analysis of the access provision during the first 4 calls allowed to classify the access provision as in line with Grant Agreement obligations, with access requested in all 6 installations. However, the demand has been unbalanced among the



different installations: whereas characterization (both SM and ECM) is highly demanded, growth and synthesis is underperforming.

Nonetheless, no clear indication came out in terms of critical issues in the catalogue and shortage to be fulfilled by new potential providers. As a matter of fact, the number of unfeasible proposals, which could mask some unmet needs from the users, was very low (5% of the eligible ones) and it was difficult to identify lacks within the catalogue, since no information on what was missing could be detected via the normal proposal channel.

On the other hand, a clear need of specific techniques that experienced oversaturation in this period was detected. In particular, the ones reported in red in the following table turned out as the most critical ones.

Table 1: analysis of the oversubscribed techniques during the first 4 calls. Legend: RED: serious concern as provided by one single provider and oversubscribed; ORANGE: less serious concern as provided by more providers or not oversubscribed; BLACK: no serious concern about the specific technique

Most demanded techniques	Reinforcement needed?
Installation 1: L&P	
EUV-IL	Yes - but no alternative identified outside the consortium
TWL	Not yet - two not oversubscribed providers in the current consortium
EBL	No – many providers offer this technique
BCL	Not yet – offered by a single provider that it is currently not oversubscribed. In any case, no clear alternative exists outside the consortium.
Installation 2: G&S	
PLD	No - many providers offer this technique
MBE	No - many providers offer this technique
MICS	Not yet - offered by a single provider that it is currently not oversubscribed. In any case, no clear alternative exists outside the consortium.
Installation 3: SM	
TEM	No - many providers offer this technique
SEM	No - many providers offer this technique
XRD	No - many providers offer this technique
STM	Not yet - two not oversubscribed providers in the current consortium
NLM	Yes, probably
Installation 4: ECM	
XPS	No - many providers offer this technique
BLS	Yes – but no clear alternative exists outside the consortium



XAS	No - many providers offer this technique
PL	Not yet - three not oversubscribed providers in the current consortium
Installation 5: Ntmm	
CCF	Not yet - two not oversubscribed providers in the current consortium
LSIVP	Yes - probably, alternatives outside the consortium exist
Installation 6: T&S	
N/A	Nothing to reinforce at present.

Discussion on the needs and perspectives

The discussion about consolidating and widening the current catalogue was carried on at different levels: it was started at UA-ACB level, during the preparation of the deliverables D2.3, D3.1, D4.1, D5.1, D6.1, D7.1, D8.1, and subsequently moved at IDRIN-ACB level with the collaboration of the TLNet; it was then finalised at ESC level.

First, it was analysed the user target community. Two options were possible: either trying to enlarge it by offering tools suitable for other scientific fields, or trying to stabilize and reinforce those communities that have recently approached NFFA-Europe. It was decided that in this moment, the strengthening of the already existing but recent community is the suitable strategy.

Second, the analysis of oversaturated techniques reported in table 1 was conducted, and this allowed to identify the criticalities in the offer and the priorities for its strengthening. The first step was to check whether the critical points could be already fixed within the current consortium, e.g. it was asked to one of the partners to consider the possibility of offering access to EUV-IL (see Table 1).

Another critical issue derives from the long shutdowns already in force in this moment- or foreseen in the short term – of different synchrotron facilities involved in our consortium; to cope with this possible obstacle, a survey among the partners that have a partial overlap with Large Scale Facilities is ongoing.

A dedicated discussion focussed on the access to neutron facilities: so far, access to neutron-based techniques was suspended due to a prolonged standstill of the reactor of our partner. Several options have been devised to redirect access to other neutron sources outside the Consortium. At present, different neutron sources are appraised, but the situation is complex for two main reasons:

- there is a general lack of access to neutron facilities: some of them, for different reasons, are not foreseeing any call for proposals in a short time
- the access costs to these facilities are very high
- there are very few neutron facilities suitable for studies at the nanoscale

In any case, a solution to overcome this stalemate is needed and still sought, in parallel to the Call: indeed, a minimum access to neutron facilities would be essential to at least complete those proposals currently in stand-by due to the absence of access to neutron techniques.



Users' query

In order to consult the direct beneficiaries of the Transnational Access and have a straightforward insight on their needs, an online questionnaire was prepared and circulated among the NFFA-Europe users.

The proposed questions were:

1. Which techniques from our catalogue do you think will benefit from extra capacity?
2. Did you meet any criticality for techniques from our catalogue? Please specify the technique and why
3. Please, specify the material/system of your interest (and for a more effective analysis the class of materials/systems) for which NFFA.EU was not able to grant access
4. Which techniques that currently are not present in our catalogue do you think will be an added value if included?

Although the users' mailing list that was used to this purpose counts more than 1500 subscribers, only 33 answers were received. Unfortunately, the take-home message from the analysis of the restricted number of feedback forms is not much clear: suggestions from users were very scattered, hence not allowing to envisage a specific need. Nevertheless, many comments have been found in line with the need of reinforcement of the oversaturated techniques; in any case, they will be taken into account during the call evaluation phase.

Spontaneous expressions of interest

From the beginning of the project, different RPOs and private companies and SMEs expressed their interest in being partners of NFFA-Europe offering specific techniques for user access. Some expressions were received by email, others during conferences and meetings.

Many previous contacts have resulted in real offers from academic laboratories specialized in: microfluidic applications; NMR spectrometers for nanomaterials in liquid, solid and semi-solid (soft) phase; a very wide offer of cleanroom services and analytical techniques.

The companies that expressed interest offered access to: nano- and micro-fabrication with state-of-the-art semiconductor fabrication equipment; nitrogen-vacancy magnetometry; direct write lithography approaches along with e-beam lithography; microsystem analyser to measure dynamic response and topography of MEMS and microstructures; high resolution laser vibrometers; atomistic/quantum simulations; 3D Micro-Fabrication Hybrid Additive-subtractive femtosecond 3D manufacturing; bi-material polymeric 3D printer; electron diffraction.

Although, at first glance, this offer does not fulfil the needs detected, the companies have been informed of the call directly, and have been invited to participate; the proposals will be evaluated in view of a possible expansion of the offer.

Analysis of needs of industrial users

In order to intercept the needs of industrial users and in general the industrial interest towards NFFA, companies that applied in September 2021 to become the NEP industrial beneficiary were asked, in the framework of the NFFA industrial program outreach and of WP18, whether they were interested in:



- benefiting from TA free-of charge access in our consortium facilities
- applying to the next call for new providers
- participating in the NEP Industry Advisory Board (IAB).

Many of them were interested and motivated to join NEP IAB, one was keen to submit proposals as users, whereas three expressed their interest about the call for new providers.

The call for new access providers

After two ESC meetings in which the details of the call for additional access providers were thoroughly discussed, the members came to the following conclusions:

1. The call is to be addressed to both academic and industrial providers; although the most requested techniques belong mainly to the academic sector, offer of services from industrial environment is most welcome
2. The new providers will contribute to strengthen and expand the current offer available on the NFFA-Europe catalogue
3. Based on the needs identified in table 1, the most important techniques to strengthen are non-linear Microscopy, Brillouin Light Scattering, Neutron Scattering, and Laser Surface and In Volume Patterning
4. The deadline for applications to this Call has been set on March 31st, 2023
5. The role of the new access providers within the Consortium (as grant beneficiary or as third-party providing in-kind contribution against payment) will be decided case by case
6. In order to better disseminate the possibility of joining NFFA as access providers, different actions have been envisaged:
 - the creation of a dedicated page on the website to illustrate the call and how to participate
 - the update of the NFFA-Europe home page of the website to highlight the call
 - the promotion action through LinkedIn by publishing a post dedicated to the opening of the call and planning a series of periodic posts until the closing of the call
 - solicit the collaboration of all partners, asking for a repost of the LinkedIn posts from both institutional and personal channels.
 - contact the EC for advice on official EU channels

All these actions will be assessed by measuring the visits to the new page to evaluate the effectiveness of the campaign.

7. As reported in the GA, the selection of the responses to the call will be assessed by the ESC upon advice of the TLNet, of the UA-ACB and of the Experts of Landscape and LTS. A priority list will be established and submitted for approval by the GeAs.

All these points were included in the text of the Call, firstly drafted by the Management team and then revised by the ESC, which is reported in the underlying paragraph together with the application form.



Text of the call for new access providers and application form

The call for providers can be found at the following link, but for an easier reading, it is reported here below, together with the application form:

<https://nffa.eu/call-for-new-access-providers>

Call for new access providers

Nanoscience Foundries and Fine Analysis - Europe | PILOT (GA n. 101007417 - NEP) looks for new access providers to complement and reinforce the current offer available in the “Tools catalogue” either as grant beneficiary or as third-party providing services against payment.

NFFA-EUROPE is an open access platform that allows researchers from the EU, associated and third Countries to access state-of-the-art facilities to carry out comprehensive projects for multidisciplinary research at the nano- and micro-scale extending from theory and numerical simulation to synthesis and nano-characterization of materials, and micro and nanofabrication of test structures and devices.

NFFA-EUROPE is supported by NFFA - Europe PILOT, a 15 million euros research project funded by the EU in the framework of the H2020 program. Its aim is to expand and consolidate an Interoperable Distributed Research Infrastructure for Nanoscience and Nanotechnology during 2021-2026. It is coordinated by the Italian Materials Foundry Institute (IOM) of the National Research Council (CNR) and involves 23 international partners (<https://www.nffa.eu/news/project-updates/pilot-nep>).

What are we looking for?

RPO's (Research Performing Organizations) and private companies (both SMEs and large enterprises) coming from EU or associated countries interested in offering access to their state-of-the-art facilities to NFFA users.

The new providers will contribute to strengthen and expand the current offer available on the NFFA-Europe catalogue in the field of nanoscience and nanotechnology (<https://nffa.eu/offer/>), that is organized in the following 6 installations:

- 1 - Lithography and Nano-patterning
- 2 - Growth and Synthesis
- 3 - Structural and Morphological Nano-characterization
- 4 - Electronic, Chemical and Magnetic Nano-characterization
- 5 - Nano to Micro/Macro
- 6 - Theory and Simulation of nanostructures

In particular, we seek new providers strengthening:

- Installation 3 concerning *Non-linear Microscopy*
- Installation 4 concerning *Brillouin Light Scattering*
- Installations 3, 4 concerning *Neutron Scattering*
- Installation 5 for *Laser Surface and In Volume Patterning*

As well as innovative *new methodologies*, complementary to those present in the current catalogue, across Installations 1-6. Offer of services from industrial environment is most welcome.

The new providers will have to:

- Readily contribute to the feasibility check on users' proposals, when prompted by TLNet*, after each of the 4 calls per year
- Guarantee quick scheduling of access to the new services whenever user projects are assigned to their facilities
- Support technically and logistically the users in preparation and during the access
- Contribute information and financial data to the UONet** concerning Travel and Subsistence of the users to their facilities for real-time monitoring, and process the reimbursement if beneficiaries



- Ensure adherence to all internal and EU-related rules for operation of the infrastructure (see <https://nffa.eu/apply>) and for reporting

* <https://nffa.eu/apply/#TLN> ; ** <https://nffa.eu/apply/#UON>

Why coming on board on NFFA Europe?

Community building: Be part of a successful Interoperable Distributed Research Infrastructure, serving European and International peer-review selected users, that already hosted over 1100 users from 50 Countries since 2015

Visibility: the contributed techniques and competences will integrate the Catalogue and become fully visible to the broadest community in nanoscience

Comprehensive benefits: the NFFA users will be highly qualified testers of all the methods and instruments open to access and will provide feedback to the providers, potentially also offering opportunities of co-creation of more advanced solutions.

Budget

The available budget will be dedicated to access cost reimbursement for transnational access, according to the EC financial rules*** and considering the overall balance among the NFFA-Europe providers. The number of Units of Access attributed to the new provider, and the associated estimated budget, will be finalized as the outcome of the call will be established.

*** https://ec.europa.eu/research/participants/data/ref/h2020/other/legal/unit_costs/unit-costs_tna-infra_en.pdf

How to apply?

If you are interested in participating in this innovative, visionary, and integrative European research project, please complete the application form:

[Download the application form](#)

Application for new access providers

APPLICATION FORM
Candidate Information
Institution or Company Name:
Postal Address (Address, City, Zip Code, Country):
Telephone Number:
<input type="checkbox"/> National Institution <input type="checkbox"/> International Institution <input type="checkbox"/> SME <input type="checkbox"/> Large Company <input type="checkbox"/> Other
Field of Activity:
Institutional Mission and Description of the Institution/Company:



Previous access provision activities (institutional, corporate, external funding programme), if any:

List of Previous Collaborative Projects (if any):

Contact Information

Contact person (First Name and Family Name):

Position:

Email address:

Offer Description

Describe the proposed technical offer and why this is complementary/synergic to the NFFA catalogue (Max. 1.000 characters):

Estimated total maximum number of Units of Access offered**:

Estimated Access Cost per Unit of Access (8-hour units) calculated according to Commission Decision C (2013) 8199 of 10.12.2013*:

* https://ec.europa.eu/research/participants/data/ref/h2020/other/legal/unit_costs/unit-costs_tna-infra_en.pdf

** The remaining overall number of Calls till the end of the Project is 7-8.

