Milestone 7.4: Intermediate assessment of the pilot access concept and process

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1. Introduction

ACTRIS is a large, highly distributed pan-European Research Infrastructure that has entered its implementation phase in 2020. The aim of the ACTRIS Implementation project (ACTRIS IMP) is to coordinate and accomplish the actions required for implementing a globally recognised long-term sustainable research infrastructure with operational services by 2025. ACTRIS IMP builds on three main pillars: i) securing the long-term sustainability, ii) implementing ACTRIS functionalities, and iii) positioning ACTRIS in the national, European and international science and innovation landscape. ACTRIS IMP will enable ACTRIS to respond to user-community needs and requirements for fully operational services and enhance ACTRIS relevance, innovation potential, and societal impacts.

A key objective of ACTRIS IMP is to implement, test and improve the ACTRIS service provision. Therefore, several pilots of access provision are offered through the transnational access (TNA) tool in WP7, including the definition of the workflow and procedures related to the access and service provision and centralized management via SAMU (Service and Access Management Unit).

The present document assesses the TNA pilot activities undertaken during the first half of the project based on the 2 calls for access that have been conducted.

2. ACTRIS IMP TNA pilot concept and processes

2.1. ACTRIS IMP TNA Pilot Concept

ACTRIS IMP provides limited pilots of TNA to specific services at 11 ACTRIS facilities comprising Topical Centres (TCs), the Data Centre (DC), National Facilities (NFs), or combined ACTRIS Facilities (NF-TC), located in 10 different countries. The objective of the TNA pilot is to implement and test the service provision and its workflows to assess and improve the reliability of the overall service provision within ACTRIS, increase the user trust and expand the user base. Access is offered to specific services described in the ACTRIS brochure and on the ACTRIS website. An overview of the facilities participating in the TNA pilot during ACTRIS IMP is given in Figure 2.1 and Table 2.1.

Services to the ACTRIS facilities are provided through physical and remote access. Particular emphasis is given to:

1) services focusing on technological development, training, forefront scientific exploration, or new services developed/made available according to user needs,
2) services having high potential for involving users from the private sector for prototype testing, joint developments, and industrial applications, and
3) services attracting new users from new/relevant regions, other scientific domains for multi-disciplinary applications, or tailored user services.

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Figure 2.1. Geographical overview of ACTRIS facilities participating in the ACTRIS IMP access pilot.

Table 2.1. ACTRIS facilities participating in the TNA access pilot.

#	*Facility*		*Host institution, Country*
1	ACTRIS DC-ARES	Aerosol remote sensing data centre unit	CNR, Italy
2	CARS-ASP-FR	Centre for Aerosol Remote Sensing-Automatic Sun/sky/lunar Photometers	CNRS, France
3	CDPS-FTIR	Central Data Processing Systems for FTIR remote sensing data	BIRA-IASB, Belgium
4	SMEAR II	Station for Measuring Ecosystem-Atmosphere Relations II	UHEL, Finland
5	JFJ	High Altitude Research Station Jungfraujoch	PSI, Switzerland
6	Cabauw	Cabauw Experimental Site for Atmospheric Research	KNMI/TUD, The Netherlands
7	SBO	Sonnblick Observatory	ZAMG, Austria
8	USRL	Unmanned Systems Research Laboratory	CYI, Cyprus

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#	Facility		Host institution, Country
9	ACD-C/ OGTAC-CC	Atmospheric Chemistry Department - Chamber combined with the Organic Tracers and Aerosol Constituents - Calibration Center	TROPOS, Germany
10	SAPHIR-CiGas-FZJ	Simulation of Atmospheric Photochemistry in a large Reaction chamber in combination with Centre for Reactive Trace Gases In-Situ Measurements - Forschungszentrum Jülich	FZJ, Germany
11	EUPHORE	European PhotoREactor	CEAM, Spain

2.2. Access process implemented under ACTRIS IMP

The TNA activity offered within ACTRIS IMP is based on specific guidelines and procedures for access that follow the Horizon 2020 rules. The technical concept is detailed in Milestone MS39 Definition of the pilot access process to ACTRIS facilities[1], including description of the access management and the modalities of access during ACTRIS IMP and specific documents and templates needed to provide TNAs according to H2020 regulations also in alignment with the ACTRIS access and service policy. MS39 is serving also as a basis to facilitate SAMU's organization of the access management system and implementation of the ACTRIS PASS – Platform for managing user access to ACTRIS ServiceS. The specific actions for each step of the TNA process (illustrated in Figure 2.2) undertaken up to M24 of the project are described below.

During the ACTRIS implementation phase and within ACTRIS IMP, the coordination of the TNA pilot is under the responsibility of CNRS. Nevertheless, both CNR and CNRS are jointly sharing and following up on the tasks related to the implementation of the user access and the organisation and testing of the service provision. Therefore, the management of the TNA is jointly managed by CNRS and SAMU/CNR. Throughout this section the term "SAMU" will be used, but it involves work from CNRS and CNR.

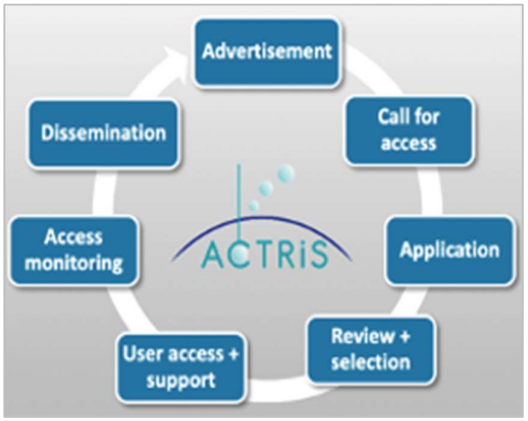

Figure 2.2. ACTRIS IMP TNA pilot process

[1] ACTRIS IMP MS7.1 Definition of the pilot access process to ACTRIS facilities

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Furthermore, it's worth noting that the COVID pandemic has strongly impacted the TNA activity in 2020-2021 which requires, apart from the needed physical presence of staff to operate the facility and instruments and capacity to provide access to users, the possibility of users to travel and access the services provided by the platforms. During the first reporting period, the user mobility has strongly been limited in most countries and by most hosting institutions in charge of the access providing facilities. A particular focus was, therefore, placed on developing and offering additional remote services to users, where possible. It is therefore planned for facilities to offer remote access where possible although not initially foreseen in the project. Although some facilities have made an extra effort to exploit their remote access to provide additional services available remotely (e.g., installing, operating, and maintaining users' instrumentation remotely), the related remote capabilities and significant additional efforts that are required are not easily available or possible at the certain facilities (e.g., simulation chambers).

2.2.1 Advertisement

The ACTRIS TNA Pilot programme and modalities of access are described on the ACTRIS website, under the Access to Services section. The 11 facilities open for access in the ACTRIS IMP project are presented as well as the TNA procedures and open calls. They are also advertised in the ACTRIS services brochure (See Figure 2.3).

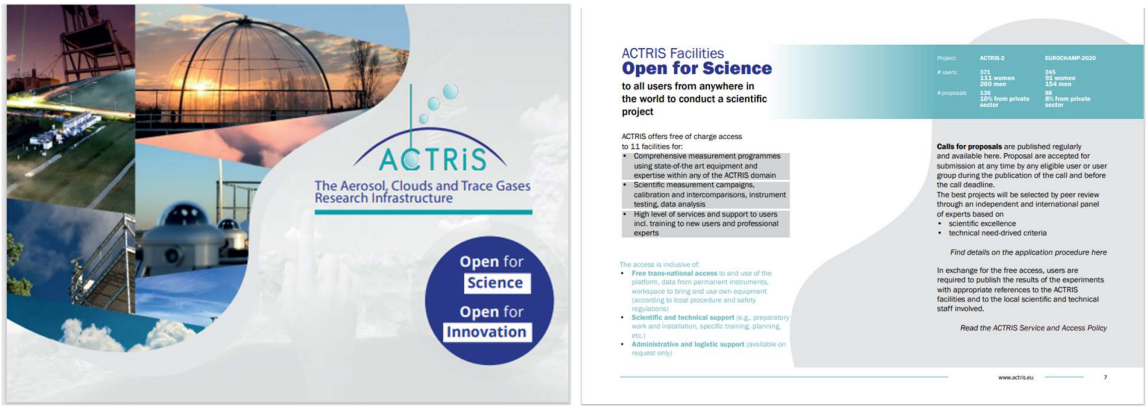

Figure 2.3 Views of the ACTRIS services brochure

Furthermore, a Catalogue of ACTRIS Services has been developed between the 1st and the 2nd call for access on the ACTRIS website. The first version of the Catalogue offers a comprehensive listing and organization of all available ACTRIS services. It is worth noting it is not the final version and will still evolve. In the future, the PASS access management platform will be linked to the Catalogue of services and will facilitate the interactions between users and providers.

The launch of the calls for access to ACTRIS IMP facilities was done in close collaboration with ACTRIS-IMP WP10 (ACTRIS communications and public relations) to ensure wide outreach and efficient dissemination. They have notably been advertised via ACTRIS website, various mailing lists within the project (notably the community generic mailing list, the innovation mailing list targeting private sector users and the national contact points), social media channels (Twitter, LinkedIn) and ACTRIS newsletter (see Figure 2.4). Mailchimp (see Figure 2.5) was used to send out the information and be able to track the number of clicks to adapt communications for future calls. The access providers were also asked to disseminate the information on their facility website. Mailing lists of international networks and coordinated observations, projects, and cooperating scientific communities have also been used to reach out to new users:

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EUROCHAMP, ENVRI (Environmental Research infrastructures) community, ENRIITC (European Network of Research Infrastructures and Industry for Collaboration), NDACC, AERONET. Direct links with international agencies (ECMWF, ESA, EUMETSAT) were also established in order to reach out to targeted user communities and international stakeholders.

Figure 2.4: Communication of the ACTRIS IMP calls for access on Twitter channel

Figure 2.5: Screenshot of the Mailchimp campaign used for informing on ACTRIS IMP Second call for access

2.2.2 Calls for access

Access to ACTRIS IMP services is based on several dedicated and specific calls for access. Three access calls are planned within the project, the call schedule is described in Table 3.1. The calls are open for 8-10 weeks, with a subsequent review period of 4-6 weeks, and a period for user access of 10-12 months (except for the last call due to required reporting within ACTRIS IMP).

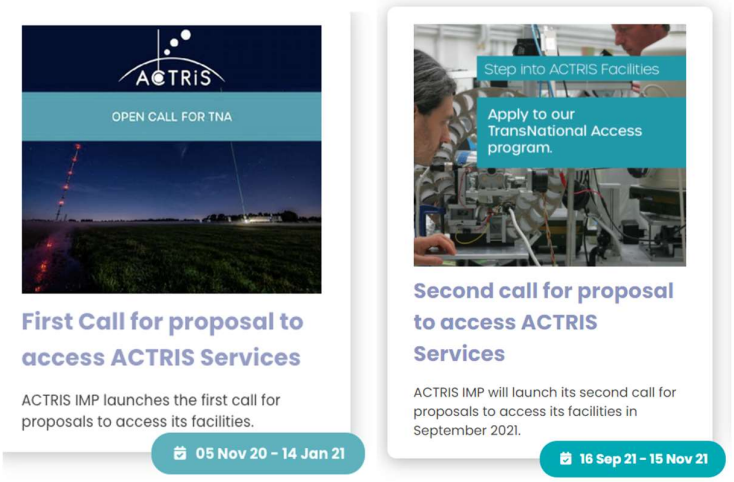

Figure 2.6: Advertisement of TNA calls on ACTRIS website

This format of calls fixed in time are meant to ensure a competitive selection according to H2020 TNA rules. Besides, this allowed to review the access process and organise feedback meetings with key actors (see Section 5) to streamline the process. However, the timings (open call / review period / access period) were intended to be flexible and allow adjustments if/where needed.

Table 2.1: TNA Call schedule within ACTRIS IMP

Call n°	Call open	Call closed	Review period	Access period
Call 1	5 Nov 2020	14 Jan 2021	→ 26 Feb 2021	Mar-Dec 2021
Call 2	16 Sep 2021	15 Nov 2021	→ 15 Dec 2021	Jan-Dec 2022
Call 3	15 Jun 2022 (TBC)	15 Sept 2022 (TBC)	→ 15 Nov 2022 (TBC)	Jan-Aug 2023

2.2.3 User Application

Access requests of any user (team of one or more users) to an ACTRIS facility must be made in writing. In the first call for TNA of ACTRIS IMP, a written application Word form, made available on the ACTRIS website, had to be submitted by the user group. The application form provides all relevant information on the user project to allow adequate review and selection of the users. It is divided in several sections: project information, PI and user group information, recent references, project description, onsite requirements, data management and dissemination plan, and foreseen budget (for physical TNA only).

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In the second call for access, based on access providers and reviewers' comments, a revised version, in online format, was developed via JotForm to ease the application process and also allow adjustment of the application form depending on the type of facility/service chosen (and associated access mode), e.g., technological/data services provided by Central Facilities (technical need-driven access mode) vs research/training/innovation services provided by observational or exploratory facilities (scientific excellence-based access mode). The 2 forms are illustrated in Figure 2.7. For the third call, applications will be submitted through a specific form integrated in the online access management platform PASS, when implemented.

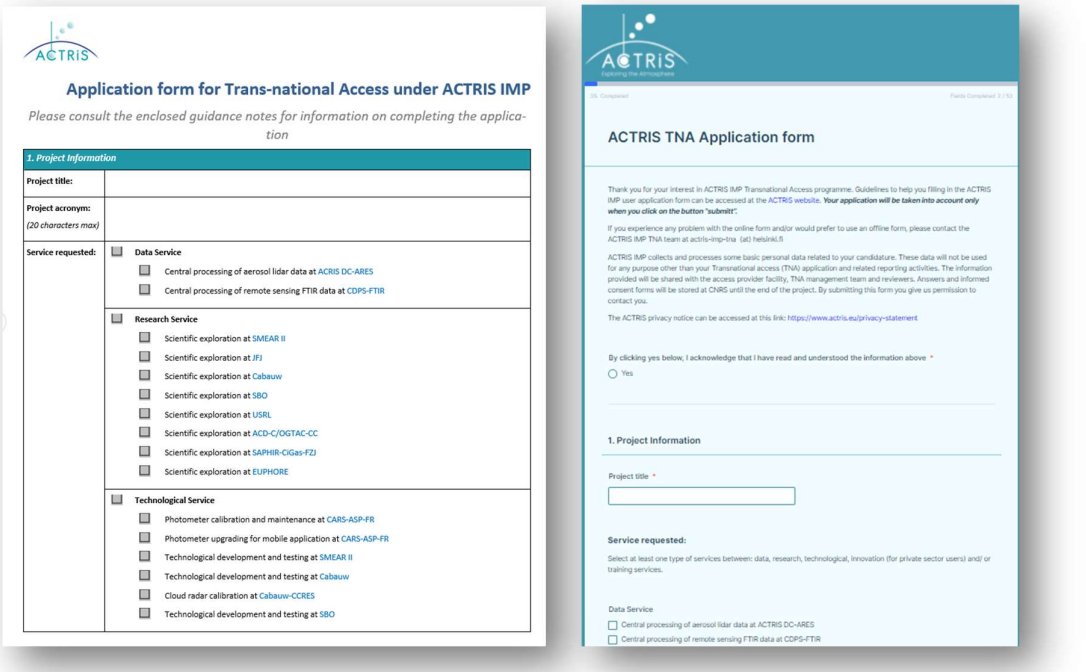

Figure 2.7: on the left: view of the application form (doc format) used in the 1st TNA call / on the right: view of the online application form used in the 2nd TNA call

2.2.4 Review and selection

WP7/SAMU has coordinated the entire review process for reviewing and selecting the users following the process illustrated in Figure 2.8.

SAMU received the user application and guided the three-stage review procedure which includes the following steps:

1. Validation by SAMU for eligibility

SAMU has verified the application for formal compliance with the EC H2020 regulations on TNA and ACTRIS eligibility criteria according to the ACTRIS access and service policy and ACTRIS Access Management Plan[2]. This check includes transnationality of the applicant, timing, completeness of the

[2] MS6.5 2nd draft of the ACTRIS Management Plan

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application, missing information if any, financial support. Interaction with users to better refine applications were done on a case-by-case basis notably to clarify access dates.

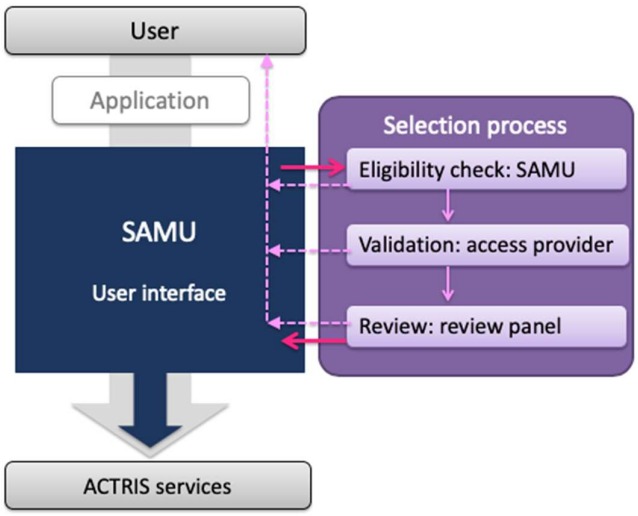

Figure 2.8. Illustration of user evaluation and selection process

2. Validation by the access provider (feasibility check)

In a second stage, the access providers were asked to fill in a feasibility check form to check availability of the services requested, the existing capacity, the scientific, technical and logistical feasibility of the project, financial feasibility and the timing of the access request. A specific template has been developed for this purpose (see Figure 2.9). Only after positive evaluation by the access provider, the next review step was launched.

*) excellent (5) / very good (4) / average (3) / poor (2) / very poor (1)

Access provider evaluation														
Scientific feasibility	*Technical and logistical feasibility*			*Temporal feasibility*			*Financial feasibility*		*Expected quantity of access required/ to be allocated (indicate unit of access also)*	*Has the user (PI or group) accessed the facility in the past?*	*Comments*			
Choice/ adequacy/ capability of facility to achieve the	Method & experimental setup	Size of user group, role/ need of user(s) to achieve objectives (adequacy of	Available on-site support at facility (instrumentation, staff, logistics, space, etc.)	Choice of project dates / availability of services / COVID	Adequacy of planned project duration (is the timeline	Available capacity at facility	Adequacy of cost planning, availability of resources	Adequacy of Travel and Subsistence costs?			Strong points	Weak points	Other comments	TNA supported?
*Please select (1-5)**	*(1-5)*	*(1-5)*	*(1-5)*	*yes / no*	*yes / no*	*yes / no*	*yes / no*	*yes / no*		*yes / no*				*yes / no*

Figure 2.9: View of the access provider feasibility check form

3. Review and selection by independent review panel

SAMU transmitted the application to an independent peer-review panel for merit assessment or for scientific and technical evaluation. The evaluation by the review panel is based on principles of transparency, fairness, and impartiality.

The members of the review panel were individually invited to participate. Expertise was required to cover the range of scientific topics in the field of atmospheric observations and processes in the field of aerosols, clouds, and trace gases; in-situ and remote sensing, and also depending on the different types of platforms (observational, exploratory, topical centres, data centre) to have an accurate review depending on the type of service requested. The panel is currently constituted of 16 experts of which 10 are external to the

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project beneficiaries and 6 are linked to project partners (the composition of the review panel may still evolve throughout the project in case of specific needs of expertise). For the evaluation, a primary and two secondary reviewers were assigned to each proposal who reviewed the proposals based on selected criteria that were previously established, and using specific evaluation templates.

For the first call, a virtual review panel meeting has been organised on February 26, 2021 to present, discuss and select the proposals within the panel. It was also a way to discuss and document the process. For the second call, the review was done fully offline to give reviewers more flexibility. Each project had 3 reviewers, one acted as rapporteur to take the lead and submit comments of the panel to SAMU. It was the opportunity to test the process as this is how it will be under ACTRIS ERIC.

The review panel evaluated and selected the applications according to the defined criteria and access modes, which comprise:

• **Scientific excellence criteria** including scientific originality, quality, state of the art, technical aspects for instrument performance and high quality, relevance and impact of the project, dissemination plan, etc.

• **Technical need-driven criteria** for increasing instrument performance (maintenance, calibration, QA) and operator training.

The **Market-driven aspects which** apply when access is defined through an agreement between the user and ACTRIS, principally in relation to business and innovation, private sector participation, technological development, innovative solutions, socio-economic impact. This access mode has not yet been tested and will be further developed in the last call.

For the evaluation of the proposals, an evaluation form (see Figure 2.10 below) has been developed which considers specific selection criteria:

- A. Depending on the access modes:
  - A1 scientific excellence (weight 40/100 points: scientific quality of the project, originality and innovation, interest to the scientific community/ relevance/ impact, quality of the methodology and work plan, and dissemination plan) or
  - A2 technical needs (weight 40/100 points: scientific quality of the project, interest to the scientific community/ relevance/ impact, measurement needs and/or geographical pertinence (service required or recommended), and dissemination plan),
- B: the use of the services (45/100 points: for technological development, prototype testing, collaboration with the private sector, training potential, cross-disciplinary objectives),
- C: user profile (10/100 points: new users, users form non-academic domains, gender equality)
- D: bonus points (5/100) for forefront scientific exploration, outstanding research topics, and contribution to new service development.

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Review panel evaluation													
Access mode: SE - Scientific excellence-driven (A1) or TN - Technical need-driven (A2)	A1 (max 40)					B (max 45)			C (max 10)				D (max 5)
	Scientific excellence (if A1 is evaluated, do not evaluate A2)					Use of Services			User profile				Bonus points
	Scientific quality	Originality and innovation	Interest to the scientific community/ relevance/ impact	Quality of the methodology (technical work plan, experi-mental set-up/ instrumentation, time line, ...)	Dissemination plan: availability and use of results (data, publications)	Technological development, prototype testing, collaboration with private sector, potential for industrial application	Training potential (ECS or user representing new region / country)	Cross-disciplinary objectives/ approoch/ impact	New user(s) of platform	Users from non-academic domain (private sector, public services (ENV agencies, climate services, space services, ...)	User(s) from non-atmospheric domain (marine, solid earth, bio-eco, health, energy, ...)	Gender equality / participation of female user(s)	Forefront scientific exploration, outstanding research topic, contribution to new service development, other (to be specified)
	(0-10)	(0-5)	(0-10)	(0-10)	(0-5)	(0-15)	(0-15)	(0-15)	(0-2)	(0-3)	(0-3)	(0-2)	(0-5)

Review panel evaluation										
A2 (max 40)				B (max 45)			C (max 10)				D (max 5)
Technical needs: increased measurement performance and quality of research activities (if A2 is evaluated, do not evaluate A1)				Use of Services			User profile				Bonus points
Scientific quality	Interest to the scientific community/ relevance/ impact	Measurement needs and/or geographical pertinence (service required or recommended)	Dissemination plan: availability and use of results (data, publications)	Technological development, prototype testing, collaboration with private sector, potential for industrial application	Training potential (ECS or user representing new region / country)	Cross-disciplinary objectives/ approoch/ impact	New user(s) of platform	Users from non-academic domain (private sector, public services (ENV agencies, climate services, space services, ...)	User(s) from non-atmospheric domain (marine, solid earth, bio-eco, health, energy, ...)	Gender equality / participation of female user(s)	Forefront scientific exploration, outstanding research topic, contribution to new service development, other (to be specified)
(0-10)	(0-20)	(0-5)	(0-5)	(0-15)	(0-15)	(0-15)	(0-2)	(0-3)	(0-3)	(0-2)	(0-5)

Figure 2.10: View of the evaluation template to be filled in by each reviewer

In addition to this form, reviewers could use a Word document to add comments on the marks given and to underline the strong and weak points of the proposal. For Call 1, reviewers got the outcome of access providers' check prior to the review meeting. For Call 2, access providers' comments were made available to reviewers throughout the whole process. Final selection was done by comparing the grades given by each reviewer and analysing their comments.

The reviewers sent their evaluation results and recommendations on the users that should benefit from the TNA to SAMU which then centralized the review results and interacted with the project leader and access provider to communicate the outcome of the review process (acceptance / revision / rejection of the application).

The decision on financial support to the project resulted of interactions between SAMU and access providers.

2.2.5 User access and support

Communication between users, providers and reviewers was done by SAMU to provide a central information and contact point on all access-related aspects.

Following the evaluation and selection process, the user is informed on the outcome of the review via a reply letter sent by the SAMU. In case of positive evaluation and selection, the user receives an acceptance letter stating the amount of financial support granted and information about post-access documentation. The users are furthermore requested to accept the TNA conditions including agreement to provide the required TNA documentation (see section 2.2.7), the obligation to disseminate the TNA results and provide the data resulting from the TNA (except for SMEs), the avoidance of double financing by signing the user acknowledgement statement (see Figure 2.11). Moreover, any reviewers' comments were transmitted to the research team to address specific issues raised in the evaluation process to improve quality and execution of the project which the user (team) is requested to address, along with the TNA reporting material (see section 2.2.7).

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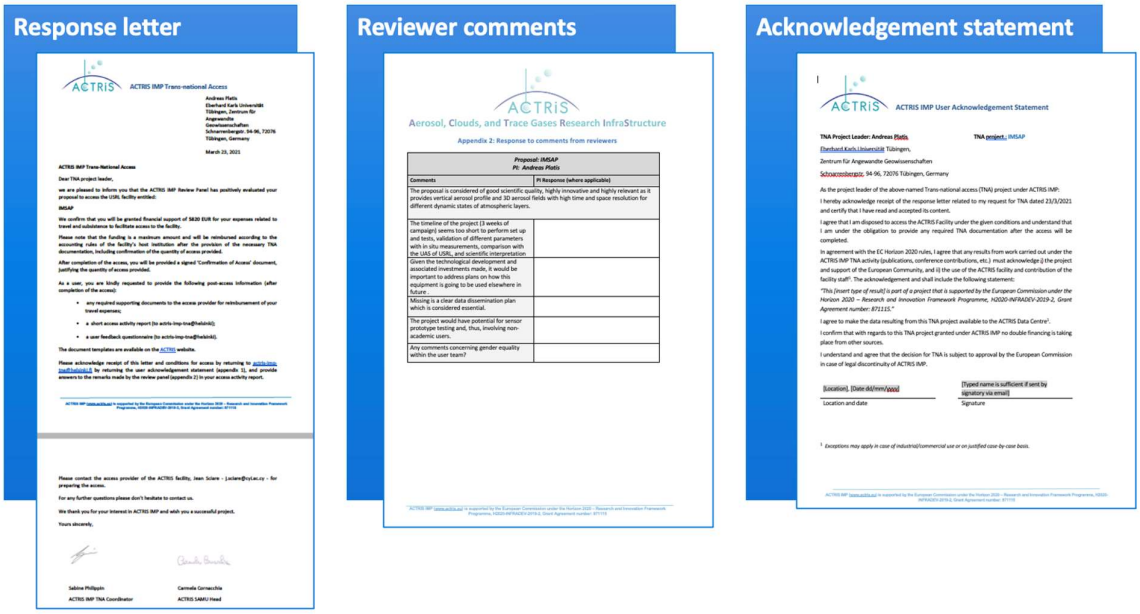

Figure 2.11: Set of reply material to TNA users

2.2.6 Access monitoring

WP7 has developed and uses a tracking file to monitor the access activities including the collection of the access metrics, with the measurement of indicators on the users (e.g., number of users, names, origin, affiliation), information on the quantity and quality of access provided, type of services requested, selection procedures, status of the project (ongoing, completed), budget spent and scientific results.

2.2.7 Post-access requirements and dissemination

After completion of the user access, WP7 Leaders/SAMU collects the TNA documents from the users for adequate access reporting and monitoring. The post access documentation – available via the ACTRIS website - includes:

- a 'Confirmation of Access' document, issued by the access provider, justifying the quantity of access provided and signed by the access provider;
- any supporting documents for reimbursement of the travel expenses (to be provided to the access provider);
- an access scientific activity report to be provided by the user for research services / a certificate provided by the access provider for technical services
- an online TNA User feedback questionnaire.

Additionally, any results from work carried out under the ACTRIS IMP TNA activity (e.g., publications, conference contributions) are collected. The TNA results produced must acknowledge the project, support of facility staff and support of the European Commission and should be reported to SAMU.

Furthermore, the users (except those coming from the private sector) are required to make the data resulting from this TNA project available to the ACTRIS Data Centre. It is planned to include this

requirement in the ACTRIS data management and curation system. This is not yet implemented but planned: in the future the TNA data will be collected, archived, data identification allowed, and access to it will be provided.

Ultimately, users are expected to make the access results available via open access and disseminate them in peer-reviewed publications. They are requested to communicate the references to the publications resulting from TNA activities to SAMU.

At the moment, reminders for submitting post access documentation and informing SAMU of publications linked to the access are done manually via email. In the future, automatic reminders will be sent by the PASS platform.

4. Summary of Transnational Access activity to ACTRIS IMP stations

Since the start of the project until M25, two calls for access have been launched. Overall, 38 proposals to 10 observational facilities were received of which 31 were selected for access support. Out of the 7 proposals which were not selected, 3 didn't fit the eligibility criteria, 1 was rejected by the access providers due to lack of capacity at the facility and 3 were not evaluated sufficiently high by the review pannel. During the first call, 18 proposals were received involving 6 of the 11 facilities, of which 2 are Central Facilities (2 Topical Centre units CARS-ASPFR and CDPS-FTIR), 2 observational platforms (SMEAR II and SBO), 1 mobile platform (USRL) and 1 combined chamber-Topical Centre (ACD-C/OGTAC-CC). During the second call, 19 proposals were received involving 6 of the 11 facilities, of which 2 are Central Facilities (2 Topical Centre units CARS-ASPFR and ACTRIS-DC ARES), 2 observational platforms (CABAUW, JFJ and SBO), and 1 Simulation Chamber (EUPHORE). The calls have an activity period of about a year, this is the reason why few projects have been completed so far.

Table 4.1 below summarizes the current status of access activities in the 11 facilities at month 25 (after the launch of the 2nd call for TNA).

ACTRIS Facility	*Estimated number of user projects*	*Actual number of projects (M25)*	*% project*	*Min quantity of access to be provided*	*Access provided (M25)*	*% access provided*	*Unit of access*
ACTRIS DC-ARES	3	**1**	**33%**	45	10	22%	SWD
CARS-ASP-FR	10	**5** / 11	**50%** / 160%	10	**5** + 11	**50%** / 160%	CAL
	3	-	**0%**	9	-	**0%**	UWD
CDPS-FTIR	3	3	100%	4	3	75%	DPS
SMEAR II	6	3	50%	30	26	87%	UWD
JFJ	4	3	75%	30	34	113%	DAY
Cabauw	6	-	**0%**	36	-	**0%**	UWD
SBO	3	1	33%	45	35	78%	UWD

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USRL	3	1	33%	40	19	48%	SWD
ACD-C/OGTAC-CC	2	**1**	**50%**	20	**15**	**75%**	DAY
SAPHIR-CiGas-FZJ	1	-	**0%**	5	-	0%	DAY
EUPHORE	2	1	50%	8	6	75%	DAY

Table 4.1: ACTRIS facilities providing TNA, units of access and number of projects planned, actual access units and project provided (black = completed TNAs and grey = ongoing).

Figure 4.1 below details the number of proposals received and their acceptance (with an 81,5% acceptance rate) at the different steps of the review process: after application phase, SAMU eligibility check, access providers feasibility check and review.

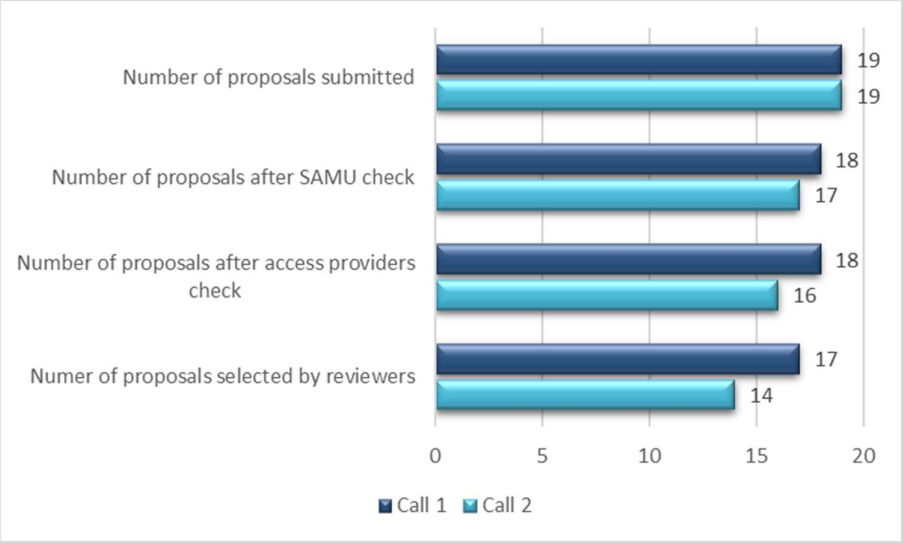

Figure 4.1: Breakdown of the number of proposals supported at each stage of the review process

Due to the ongoing access process and, therefore, low number of completed TNA projects at M25, the insights on users' profile are presented on the information included in the application form. Final statistics will be reported in MS7.6 Final assessment of the pilot access concept and process.

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Following the 2 calls, 51 users of which 29% are female (Figure 4.2) are expected to access ACTRIS IMP facilities. 84% of the users are from the academic sector (universities and research organisations), 10% public sector - Slovak Hydrometeorological Institute, UK Met. Office - and 6% private sector – MIRO Analytical AG, Aerosol Doo. (Figure 4.3). New users – based on the individual not on the institution - represent 42% of the total number of users.

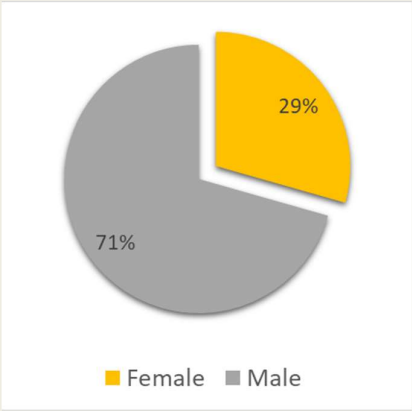

Figure 4.2: Representation of female users

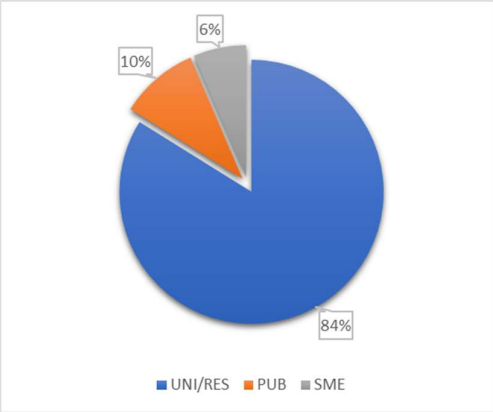

Figure 4.3: Breakdown of users per affiliation (academia, public sector, private sector)

Regarding user origin, as shown in Figure 4.4, 80% of applicants work at institutions based in European member and associated states, 20% are from outside the EU (Australia, Canada, Russia, Japan). 45% of the users work at institutions based in the 17 potential ACTRIS member and observer countries[3] and 55% are external (Figure 4.5).

[3] 17 countries were initially anticipated as ACTRIS member/observer Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Poland, Romania, Spain, Switzerland

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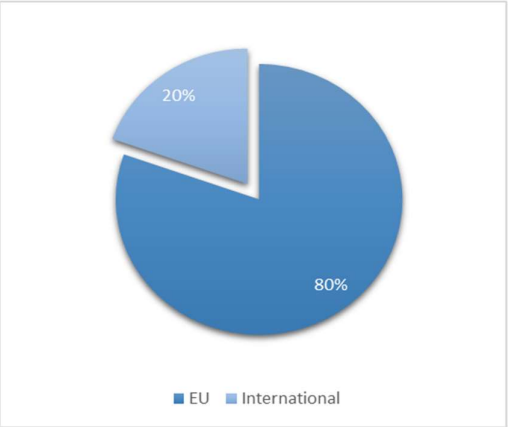

Figure 4.4: Breakdown of TNA users' projects originating from countries within and outside EU

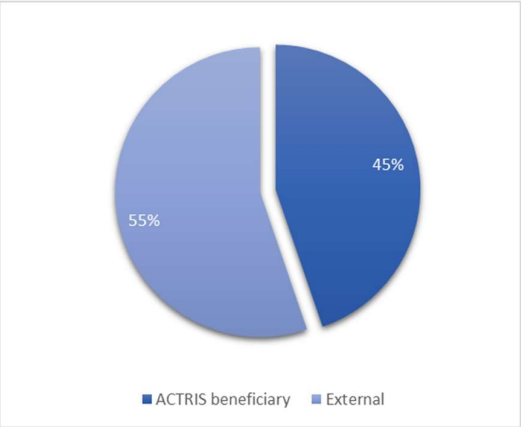

Figure 4.5: Breakdown of TNA users' projects originating from ACTRIS beneficiaries) and external institutions

The majority of requests, 68%, concern services provided by ACTRIS Central Facilities being mostly available via remote access (Figure 4.6) notably for calibration of instruments or data processing. Figure 4.7 shows the breakdown of selected projects in terms of access types: 71% of projects are done via remote access, 23% physical and 6% combination of both.

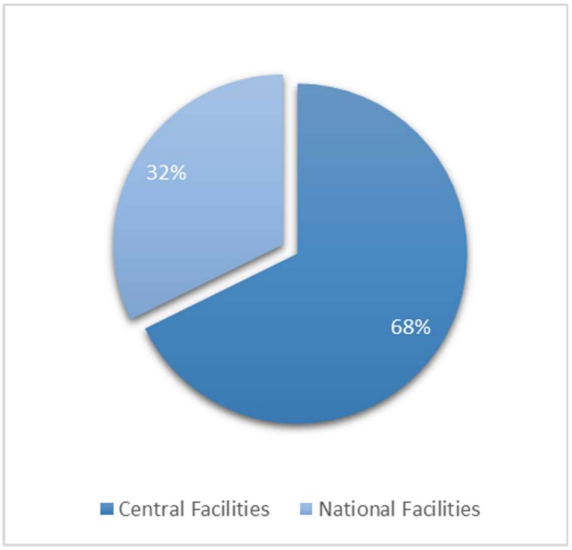

Figure 4.6: Representation of requests to Central and National Facilities

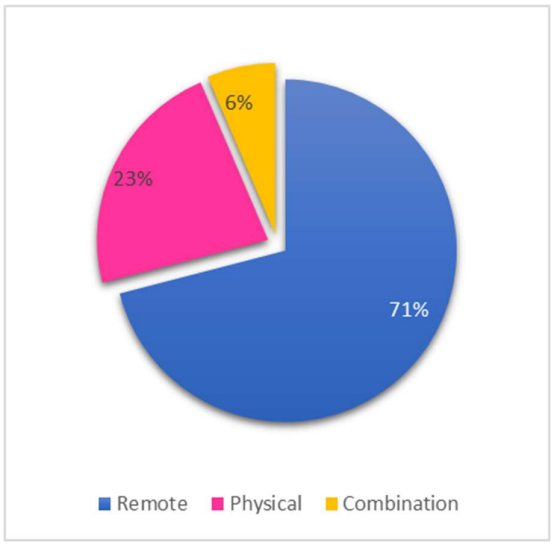

Figure 4.7: Breakdown of selected project per access type (remote, physical and combination of both)

18 projects concern technical services, 4 data services, 9 research services of which 1 are related to innovation, and 2 training services (Figure 4.8).

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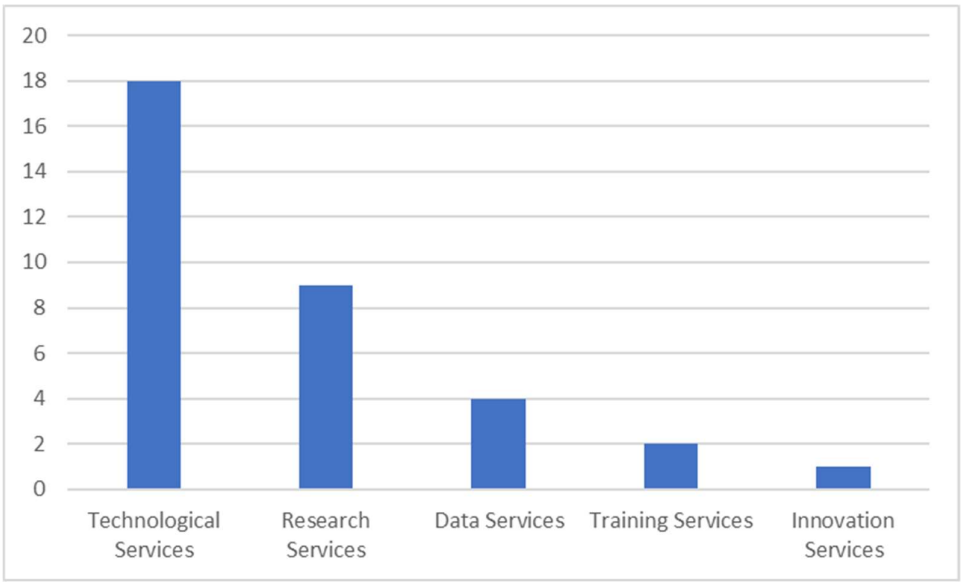

RESEARCH SERVICES

- Physical access to instrumented observational and exploratory platforms for realisation of scientific experiments under ambient or controlled conditions
- Use of state-of-the-art instrument and equipment supporting scientific excellence

DATA AND DIGITAL SERVICES

- Compilation and quality control of ACTRIS measurements from both observational and exploratory platforms
- Long-term archiving and preservation of ACTRIS data, comprising raw data, calibrated and quality-assured data up to fully quality controlled data and elaborated data products
- Access to high-quality & long-term data, data for operational response, near real-time data and early warning services
- Documentation of data and data flow
- Citation service, and data attribution, including version control, and data traceability
- Data curation for campaigns and dedicated research projects and initiatives, external or internal to ACTRIS.

TECHNICAL SERVICES

- Provision of measurement quality assurance and quality control procedures and tools
- Instrument-specific calibration, testing, and intercomparison
- Improvement of measurement and retrieval methodologies for aerosol, clouds, and reactive trace gases

INNOVATION SERVICES

- Design and co-design of instrumentation, equipment or procedures
- Exploration of instrument synergies and novel innovative research capabilities
- Joint research activities
- Joint instruments testing
- Certification of prototypes
- Development of new observation techniques for aerosol, clouds, and reactive trace gases
- Improvement of measurement and retrieval methodologies for aerosol, clouds, and reactive trace gases

TRAINING AND EXPERTISE

- Training on demand or targeting specific user groups from industry and academia to develop specific skills along with public and private innovation requests
- Training of instrument operators and data managers to ensure compliancy with ACTRIS standards
- Training of users of ACTRIS data, products and tools and training of young scientists and users from new regions world-wide
- Best practice, knowledge sharing and knowledge transfer internally and to ACTRIS users (publications, seminars...)

OUTREACH SERVICES

- Catalogue of services
- Scientific breakthrough, publications and seminars will contribute to the advancement of science through publication and scientific networking
- Outreach to the general public and especially youth to explain in simple terms the importance of the atmospheric constituents

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Figure 4.8: Breakdown of requested ACTRIS services type and explanation of the service types as detailed on the ACTRIS website

So far, only 6 (out of 17) projects from Call 1 have been completed and reported to WP7/SAMU, as detailed in table 4.2. The second call results were communicated to users in December 2021 and the TNAs have not started yet. The calibration certificates and activity report are available in Annex 1. 3 projects from the first call combining physical and remote access are still on-going. Due to the pandemic and travel restrictions, some users had to postpone their visits.

Call #	*ID*	*Station*	*PI Name*	*Affiliation*	*CY*	*Project name*	*Quantity of access provided*	*Unit of access*	*Status*
C1	**ACD-1**	**ACD-C/OGTAC-CC**	Dean VENABLES	Uni College Cork	IE	Burn Chamber experiments for Fire, Land and Atmospheric Remote sensing of EmissionS	15	DAY	achieved
C1	**CARS-3**	**CARS-ASP-FR**	Tanja Dreischuh	Institute of Electronics, Bulgarian Academy of Sciences	BG	Joint ASP and LIDAR Observations of the Aerosol Field over Sofia City	1	CAL	achieved
C1	**CARS-5**	**CARS-ASP-FR**	Natalia Kouremeti	PMOD/WRC	CH	DAVCIM-RECAL	1	CAL	achieved
C1	**CARS-6**	**CARS-ASP-FR**	Bas Henzing	TNO	NL	Calibration TNO Aeronet sunphotometer	1	CAL	achieved
C1	**CARS-7**	**CARS-ASP-FR**	Vincenzo Rizi	Università degli Studi dell'Aquila (UniAQ)	IT	Potenziamento della componente italiana della Infrastruttura di Ricerca Aerosol, Clouds and Trace Gases Research Infrastructure Lunar-Sky-Solar Photometer CALIBRATION	1	CAL	achieved

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C1	**CARS-8**	**CARS-ASP-FR**	Joelle Buxmann	UK Met Office	UK	AERONET sun photometer calibration of UK Met Office instruments.	1	CAL	achieved
C1	**SMR-1**	**SMEAR II**	Michihiro MOCHIDA	Nagoya Univ.	JP	Offline characterization of the hygroscopic and light absorbing properties of organic aerosol over a boreal forest	30	UWD	ongoing
C1	**SBO-1**	**SBO**	Pia Bogert	KIT	DE	Cloud in situ measurements of atmospheric ice nucleating particles at SBO	35	SWD	ongoing
C1	**SMR-3**	**SMEAR II**	Maximilian MAAHN	Leipzig Uni	DE	Combining Radar and Imagining Observations for Snowfall measurements	16	UWD	ongoing
C1	**CARS-9**	**CARS-ASP-FR**	Andy Ruth	UCC	IE	Contribution of sun photometer data from University College Cork to AERONET	1	CAL	ongoing
C2	**CARS1**	**CARS-ASP-FR**	Lucja Janicka	Uni of Warsaw	PL	UoW Calibration	1	CAL	ongoing
C2	**CARS2**	**CARS-ASP-FR**	Holger Baars	TROPOS	DE	ACTRIS-D OSCM	1	CAL	ongoing
C1	CARS-1	CARS-ASP-FR	Thomas Ruhtz	Freie Universität Berlin	DE	FUBACAL2021	1	CAL	planned
C1	CARS-4	CARS-ASP-FR	Maria Rita Perone	Uni of Salento	IT	LEC-PHOT-CAL-2021	1	CAL	planned
C1	CDPS-1	CDPS-FTIR	Isamu Morino	National Institute for	JP	DEMO-CDPS-NIES	1	DPS	planned

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				Environmental Studies					
C1	CDPS-2	CDPS-FTIR	Kimberly Strong	Uni of Toronto	CA	DEMO-CDPS-UoT-CA	1	DPS	planned
C1	**CDPS-3**	**CDPS-FTIR**	Nicholas Jones	University of Wollongong	AU	DEMO-CDPS-UoT-AU	1	DPS	planned
C1	**USRL-1**	**USRL**	Andreas Platis	Univ Tübingen	DE	IMSAP	**126**	**UWD**	planned
C1	**SMR-4**	**SMEAR II**	Morten Hundt	MIRO Analytical AG	CH	BEMIGA	**10**	**UWD**	planned
C2	**CARS3**	**CARS-ASP-FR**	Patric Seifert	TROPOS	DE	LACROS mobile platform for aerosol and cloud monitoring	1	CAL	planned
C2	**CARS4**	**CARS-ASP-FR**	Hugo Ricketts	University of Manchester	UK	Capel Dewi Atmospheric Observatory (ongoing measurements)	1	CAL	planned
C2	**DC-ARES1**	**ACTRIS DC-ARES**	Juraj Kostyk	Czech Hydrometeorological Institute	CZ	Lidar Processing using SCC	1	SWD	planned
C2	**CARS6**	**CARS-ASP-FR**	Aleksander Pietruczuk	Institute of Geophysics PAS	PL	CIMEL #860 calibration	1	CAL	planned
C2	**CARS7**	**CARS-ASP-FR**	Peter Hrabčák	Slovak Hydrometeorological Institute	SK	Optical properties of aerosols in Poprad-Gánovce area	1	CAL	planned
C2	**CARS9**	**CARS-ASP-FR**	Tanja Dreischuh	Institute of Electronics, Bulgarian Academy of Sciences	BG	AERONET Calibration and Maintenance of IE-BAS Sofia Sun/Sky/Lunar Photometer	1	CAL	planned
C2	**CARS10**	**CARS-ASP-FR**	Joelle Buxmann	UK Met Office	UK	AERONET sun photometer calibration of UK Met Office instruments.	1	CAL	planned
C2	**CARS11**	**CARS-ASP-FR**	Thomas Ruhtz	Freie Universität Berlin	DE	Freie Universität Berlin Aeronet-Calibration 2022	1	CAL	planned
C2	**EUPH1**	**EUPHORE**	Anke Noelscher	University of Bayreuth	DE	TVOCX: Training on VOC oXidation products analysis	6	DAY	planned
C2	**JFJ1**	**JFJ**	Martin Rigler	Aerosol doo	SL	Carbon balance field campaign in free troposphere with intermittent planetary boundary layer influence	10	DAY	planned

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C2	**JFJ2**	**JFJ**	Stephen Andrews	Uni of York	UK	Carbon balance field campaign in free troposphere with intermittent planetary boundary layer influence	15	DAY	planned
C2	**JHJ3**	**JFJ**	Thérèse Salameh	IMT NE	FR	Carbon balance field campaign in free troposphere with intermittent planetary boundary layer influence	8	DAY	planned

Table 4.2: Overview of the TNA projects supported by ACTRIS IMP

5. Testing the service provision

The TNA pilot aims at supporting the implementation of the user access and service provision system, in collaboration with Task 6.4 Organizing the ACTRIS user access and services provision system, in order to optimize the overall access process within ACTRIS and improve the reliability of the overall services provision. This is realized by documenting in detail each step of the access process and by testing and assessing the access workflow and functionalities. Following the first call for access and proposal review, three dedicated virtual meetings have been organised with the main actors – SAMU, access providers, reviewers and users - involved to discuss the concept and efficiency, reflect on lessons learnt, identify design issues and detect shortfalls at each of the steps in order to improve the access process: on April 13, 2021 with the review panel members, on May 5, 2021 with the access providers, and on July 1, 2021 between CNRS and CNR/ SAMU. The outcomes of these meetings were considered in the "upgrading" of the access process and preparation of the 2nd call for access in September 2021 and adaptation of the access process documentation used (e.g, application form). The feedback of the users is crucial and will also be considered, once the accesses are completed, via the specific user questionnaires. It is also planned to organise a dedicated virtual user meeting in the last year of the project in order to present some select TNA user cases and results. The organisation of the specific discussion meetings in this pilot activity, additionally to the regular access process, is illustrated in Figure 5.1.

Figure 5.1: Timeline of review meetings between key actors

The different views on each of the access process steps are summarised in the following from the perspective of SAMU, Access providers, reviewers, and users.

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5.1 WP7/ SAMU perspective

Table 5.1 below summarizes the comments and suggestions for improvements on the access process proposed by WP7 TNA management Team composed of CNRS and CNR (SAMU).

Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
Advertisement and calls	Call information & Outreach	The call shall be announced on the ACTRIS website and on the facilities' website and disseminated as widely as possible. Enhancing private sector participation via a specific campaign together with access providers could be more efficient. Using travel and subsistence money for them could be an incentive. The description of services in the catalogue of services is key. A specific meeting could be organised with access providers to show them the catalogue.	Need to have a clear communication strategy related to access notably to reach out to new users, to private sector users, reach beyond atmosphere domain and be attractive. Implementation of the catalogue and time to set up the overall process.
	Call format	The calls with a fixed deadline ensure competitivity in the selection process and allow to test the access process. A continuous call could be envisaged for the last call for access to allow more flexibility.	Develop an optimum format to give sufficient time for users to apply and for SAMU and evaluators to treat the TNA requests
Application process	Application forms format	Separate the application forms between NF and CF as the information needs is different for the 2 platform types. A transition from pdf forms to the PASS platform was decided. A common online form with mandatory fields was developed in view of making the application	Try to find the right balance between effective forms and gathering all information needed for follow up and reporting.

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
		form lighter for the technical services.	
	Application forms information	Ask for recurrent users' publications and for TNA data provision to ACTRIS data centre. Indicate type of ACTRIS component concerned	Make use of the form to track publications and remind users of data provision obligations
	Interactions between users, SAMU and providers	It is foreseen to link to the description of services in the ACTRIS catalogue of services. Users will be encouraged to contact the access provider prior to submitting application to engage communication. This will save time regarding the feasibility check.	Make sure the contact is initiated prior to application to better tailor the project and ease the review process
	Timeline of the call	Letting the call open for 8-10 weeks seems sufficient for users to send their applications. However, the opportunity to allow access requests even outside the deadlines shall be envisaged for exceptional cases (e.g., required instrument calibrations, fast-track, tailored access) and specific users (e.g., private sector)	Ensure effectiveness of access process to reduce time between application and access to the facility.
Review process	Access provider evaluation	Leaving 10-15 days for the access providers' evaluation seems a good compromise, as one week could be too short notice (in case no previous communications were exchanged with the user before submission). To improve accessibility to access information while PASS is not yet available, the proposals will be included on the ACTRIS intranet. This will	Ensure all information needed is given to the access provider (mostly through forms or emails exchanges)

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
		be remedied with the planned online access system.	
	Panel evaluation	An offline review is be envisaged, SAMU would assign primary (acting as rapporteur) and secondary reviewers for each proposal to streamline the process. The rapporteur would be summarizing the individual assessments and formulating recommendations for the selection.	Find adequate timing and process for review to have a light process for SAMU, reviewers and users.
Access monitoring	TNA Tracker and KPI	Tracking of TNA users on different aspects is required. E.g., users coming from ACTRIS member / observing countries could be done but as ACTRIS IMP TNA is project based (and not RI based) no bonus point will be allocated.	Gather insights for reporting purposes.
	Collection of TNA documents	For calls 1 and 2 done offline by email reminders, it will become more automated when PASS is in place.	Gather TNA post access documentation in a timely manner.
	Publications	Involving the access providers in the collection of information on publications resulting from access could be a way of gathering more precise information.	Ensure TNA support is adequately acknowledged

Table 5.1: SAMU insights on ACTRIS IMP TNA process

The share of responsibilities between CNRS and SAMU/CNR to ensure a smooth transition and to gradually shift the organizing of the user access and service provision system to SAMU was also discussed. It is agreed that when the PASS platform will become available, SAMU will take a larger role in ACTRIS IMP TNA management.

5.2 Access providers' perspective

Table 5.2 below summarizes the improvements or comments on the access process proposed by access providers involved in ACTRIS IMP Pilot.

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
Advertisement and calls	Call information & Outreach	Most facilities have been in contact with the users during the application process. Some access providers have informed or reminded users of the call (notably Topical centres) which seems crucial to reach out to users.	Exploit all communication channels including facilities' websites and mailings.
	Call format	The question of open call vs specific call for access was discussed as it was asked for by CF and for specific users (private sector). The calls with fixed deadlines allow evaluation of the process more effectively and on competitive basis than open calls. For call 1 it was done as it was to discuss details, for call 2 it was the transition to long-term system. Call 3 will be all online via the PASS platform and may allow more flexibility and efficient streamlining of the process.	Ensure rapid access to facilities when demand arises.
Application process	Application forms information	Not enough detail was given on the instrument in the application form. This would have helped access providers to better understand the user request. More information on the data management plan was also requested. It should be made a mandatory requirement to make sure users reflect on this issue prior to applying. Having specific fields for Topical centres and National facilities would be good.	Try to find the right balance between gathering all information needed to evaluate the project and the complexity of the form

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
	Interactions between users, SAMU and providers	There is a need for interaction between user and access provider to better tailor their application and which appears essential for both users and access providers. In the service catalogue, users will be encouraged to contact the access provider for discussing initial technical details. If the SAMU receives helpdesk requests, it will redirect scientific and technical requests to the access providers.	Invite to have this interaction prior to submitting the application.
	Timeline of the call	No comment	
Review process	Access provider evaluation	10 to 15 days is enough for the feasibility check to give sufficient time for reaction. It might be nice to give feedback after the review meeting (the other way round of how it is currently organised) to avoid non meaningful comments. Some reviewers may not have a good understanding of the facilities.	Ensure effective sharing of information between all the actors involved.
	Panel evaluation	The review process should be shortened in the case of calibrations and more flexible in terms of timing.	
Access monitoring	TNA Tracker and KPI	The profile of the end users is an important KPI and should be considered in the tracking file.	Gathering sound insights on users is key for adapting service offer.

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
	Collection of TNA documents	For research, innovation and training services, a confirmation of access and scientific report are requested. For technological and data services, service reports should be developed CARS issues a calibration certificate. For the others, a one-page report could be generated.	Develop meaningful activity reports for technological and data services provided by the Central Facilities.
	Publications	Tracking of publications is important to document the results and benefits of the TNA, and is also required by the European Commission during the project lifetime. Due to the time lag, a significant number is expected to be missed after project completion. In past projects, EUROCHAMP 2020' access providers after the TNA are asked to provide data and thus had the acknowledgements or had co authorship mentioned in users' publication. This is not necessarily the case for observation platform. Regular reminder to TNA users may be a way of collecting information as suggested by the review panel. Fortechnological and data services, data availability should be considered as a publication and tracked with DOI.	Access providers could act as relays to inform SAMU of accepted publications related to TNA projects. SAMU should send regular reminders to TNA users even after project completion and keep a user database for further communication.

Table 5.2: ACTRIS IMP Access providers' insights on ACTRIS IMP TNA process

To better streamline the process and share knowledge, a training should be organised in the future for sharing best practices with new access providers. This need for training was expressed in ACTRIS IMP MS6.6 Updated analysis of user needs.

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5.3 Reviewers perspective

Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
Advertisement and calls	Call information & Outreach	Facilitation of market-driven access modes should be improved; this should be developed further for call 3. ACTRIS should promote the collaboration with the private sector, in order to boost innovation. Industrial users will not have to publish all the results of the TNA but could put feedback / best practices to feed in the ACTRIS website to share the potential benefits of TNAs for SMEs in general.	Test market-driven access during call 3 (including definition of criteria for evaluation) and target private sector users
	Call format	Having open call for needed calibration, private sector users could be foreseen in accordance with the access providers and the SAMU	
Application process	Application forms format	Simplifying the application process for TC services with a dedicated form.	Find the more effective format for users of TC
	Application forms information	The application form should meet better the review criteria to facilitate the reviewers' work: dedicated fields on dissemination plan, explanations on the choice of the platform and adding better explanation on the review criteria will be added to the form. ➢ Add some dedicated fields on dissemination plan and in general give it more emphasis in the form. ➢ The profile of the TNA users is	Ensure all information needed for sound review is gathered.

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
		indicated but emphasis should be put on the training. ➢ Ask more specifically on the choice of platform to perform the project ➢ Better explain the evaluation criteria	
	Timeline of the call	Users need to well prepare the application in terms of timing and flexibility of the access (seasonality of the projects)	Some project requires specific weather conditions
Review process	Access provider evaluation	Availability of results of the feasibility check to reviewers will be added.	Ensure effective information sharing between all actors.
	Panel evaluation	Application to TC will still go through the three-stages review for transparency and consent, since H2020 requirements stipulate a selection of users via a panel. It was obvious that different criteria are required depending on the service type (e.g., to avoid in case of calibrations to loose points for aspects such as multidisciplinarity and training), and suggested to have a different review form for compulsory calibrations.	Streamline the process to ensure time effective review.

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Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
		The timing of the review could be shortened to 2 weeks (instead of 4), if the schedule is known sufficiently in advance. The online meeting format was appreciated by reviewers to discuss all proposals, offline review will be more effective in terms of timing.	
Access monitoring	TNA Tracker and KPI	It is important to attract new users and new institutions but it's also a test of the service. There should be a good balance between both aspects.	Try to enlarge the user database.
	Collection of TNA documents	Reviewers should have easy access to TNA scientific activity reports. For the time being, they should be made available via ACTRIS Intranet. The PASS will allow better information sharing. Mention the platform with the support offered by facility staff and operators and ACTRIS IMP in the acknowledgement statement should be reminded to users.	Sharing efficiently the outcome of the projects and sending reminders once new documents are available
	Publications	It is generally agreed that it is very hard to link a publication to a specific TNA project. The TNA can be a starting point for the publication, but it does not always or entirely constitute the full material for an article. It is suggested to ask in the activity report to inform the coordination office when the publication is planned to be released.	

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5.4 Users' perspective

The users' perspective is currently collected via a post-access feedback questionnaire (accessible online: ACTRIS IMP User Feedback Questionnaire). This feedback collection is crucial to adapt the services offers to the user needs. Being attractive to users is not only about the type and quality of services, but easiness of the overall access system which must be facilitated as much as possible. Given the timing (completion of the visit and / or delays with respect to Covid-19 related travel restrictions) only 6 answers have been collected so far, some feedback collected is presented below.

Category	Item	Discussions/ Suggestions for improvement	Challenges / bottlenecks
Advertisement and calls	Call information & Outreach	Most users received information via colleagues and mailings (80%) and were mostly satisfied with the communication around the TNA opportunities.	Evaluate the most efficient communication pathways for both recurrent and new users
	Call format	n/a	
Application process	Application forms	Users were overall satisfied with the application form, easiness and level of details asked for. Some would rather favour separate/different application forms for the different types of services provided, or at least a separate one for the technological services (e.g. photometer calibration and maintenance).	Facilitate the application process for users while ensuring all key information for access and reporting are gathered
	Timeline of the call	n/a	
Access monitoring	Interaction with access provider	All users were satisfied with the onsite support and communication with access providers.	Effectiveness of access and service offered is key to users
	Collection of TNA documents	The quantity of post access documentation was judged acceptable by most users.	Keep the access process as light as possible

One suggestion for improvement was that efforts should be directed to the development of different application forms and the corresponding reporting documents for the different types of services, or at least for the technological services.

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Further feedback was received on social media via Tweets underlining the interest of ACTRIS IMP TNA programme (Figure 5.2).

An online users' meeting will be organised by M44 of the project as an opportunity to gather more direct feedback.

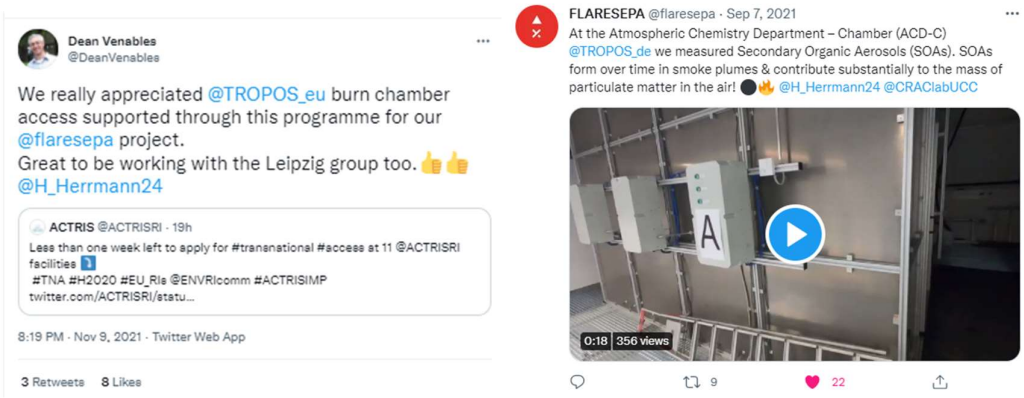

Figure 5.2 TNA user feedback tweets

6. Evaluation of the service provision

Based on ACTRIS PPP Milestone 26: Definition of Key Performance Indicators related to ACTRIS service provision, specific Key performance indicators (KPIs), several indicators have been chosen by WP7/SAMU to evaluate the TNA Pilot success. The KPIs below will be revised in MS7.6 Final assessment of the pilot access concept and process and trends could be established as it is at the moment hard to compare these numbers.

6.1 Organisational metrics

Category	Performance Indicator	Definition	Metrics (M25)
Visibility	**Number of pages views on ACTRIS website TNA part**	Measure of visibility and web presence	537 views on the open calls page 470 views on the Apply to TNA page
	Time spent in exploring the ACTRIS TNA pages	Measure of relevance of service catalogue	Average time spent on pages of 2 minutes
	Number of impressions on ACTRIS TNA related tweets	Measure of visibility in social media	Average of 7500 impressions per tweets on TNA

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Category	Performance Indicator	Definition	Metrics (M25)
Access process	**Number of user helpdesk requests**	Measure of capacity for stimulating user interest	Average of 15 requests / 19 proposals received
	Average duration of access process, in weeks (from date of user request to acceptance by SAMU)	Measure of ACTRIS readiness for regular processing of user requests	6-8 weeks
	Average duration of evaluation of user request by selection panel, in weeks	Measure of readiness of review panel	2-3 weeks
	Level of access provider satisfaction of access process and interactions	Measure of access providers satisfaction: not satisfied (1), slightly satisfied (2), moderately satisfied (3), very satisfied (4), extremely satisfied (5)	3,5
	Level of reviewers satisfaction of access process and interactions	Measure of access providers satisfaction: not satisfied (1), slightly satisfied (2), moderately satisfied (3), very satisfied (4), extremely satisfied (5)	4
	Level of users satisfaction of access process and interactions	Measure of access providers satisfaction: not satisfied (1), slightly satisfied (2), moderately satisfied (3), very satisfied (4), extremely satisfied (5)	4,4
	Level of SAMU satisfaction of access process and interactions	Measure of SAMU satisfaction: not satisfied (1), slightly satisfied (2), moderately satisfied (3), very satisfied (4), extremely satisfied (5)	4,2

These metrics aims at evaluating the quality of organising and managing the access process with respect to visibility and efficient interaction between the access key actors. It shows that access opportunities have triggered interest from the community. The fixed call format did not allow for fast track market-driven access which could be developed and defined in the last call. ACTRIS IMP should exploit all communication channels to advertise the platforms offering TNA as part of the project.

Operational metrics

The following operational metrics aim at evaluating the capacity of the ACTRIS service provision.

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Category	Performance Indicator	Definition	Metrics (M25)
Access statistics	**Number of services requested by users**	Measure of user demand	38
	Number (and percentage) of requested services accepted	Measure of quality of user request	31 (81.6 %)
	Number (and percentage)of projects provided vs planned	Achievement of project goals	31 out of 52 planned (60%)
	Quantity of access provided to users in units of access	Measure of the quantity of access provided, expressed in corresponding units of access of the service concerned access	20 UA provided (+ 143 planned)
	Number (and percentage)of access provided vs planned	Achievement of project goals	20 UA provided out of 318 (6%)
	Percentage of physical/ remote access provided in units of access	Measure of operational capacity for access provision as a function of access type	71% R 6% P+R 23% P

In the ACTRIS IMP grant agreement, 52 user projects were foreseen. On the 38 projects submitted, 31 projects / 82% have been selected for support. Before final acceptance some proposals needed further information to be able to pass the review stage. 318 Units of access were foreseen, so far only 20 have been completed but 143 are planned. Due to the COVID-19 restrictions, some TNA initially involving physical access became fully remote, other projects have not yet started due to these restrictions as detailed in Section 2.2 of this report. The share between remote and physical access will be re-evaluated at the end of the project.

User metrics

The user metrics aim at evaluating the size and extent of the user community, as well as the user need and satisfaction.

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Category	Performance Indicator	Definition	Metrics (M25)
User access	Number of user requests for access received by SAMU	Measure of the total number of requests received from users	38 requests received
	Number of individual users served	Measure of the ACTRIS capacity to serve users	47 users supported (8 completed their access)
	Number (and percentage)of user served vs planned	Achievement of project goals	8 users out of 102 planned (8%)
	Number of users per country	Measure of the origin of users per country	Users originate from 15 countries (cf section 4)
	Percentage of users originating in the 17 potential ACTRIS member countries	Measure of the user base within the RI perimeter	45%
	Percentage of users originating in European countries and associated states	Measure of the user base within Europe	80%
	Percentage of user groups originating in countries outside Europe	Measure of the user base worldwide and of the capacity for international collaboration	20%
User type	**Number of users per scientific field**	Measure of the capacity for attracting users from other domains	100% ENV ATMO field
	Number (and percentage) of users from academic and public research organisations	Measure of users from academic and public research organisations	26 projects, 40 planned users (84%)
	Number (and percentage) of users from public sector	Measure of users from public sector	3 projects, 3 planned users (10%)
	Number (and percentage) of users from private sector (business and industry)	Measure of users from private sector	2 projects, 4 planned users (6%)
User profi	**Percentage of new users**	Measure of attracting new users	42% of new users in M25

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Category	Performance Indicator	Definition	Metrics (M25)
	Percentage of young users (students, early career scientists, ...)	Measure of training capacity	Too early to have sound results (based on confirmation of access)
	Percentage of female users	Measure of gender balance	29%

The metrics presented are an aggregation of planned and completed projects. At the moment, analysis is performed using data on the application forms, these figures would need to be confirmed after access completion. In the G.A., the expected number of users is 102, so far, 47 users planned to access ACTRIS IMP facilities. Due to Covid-19 and larger use of remote access, maybe less users - and notably international users - would travel to the facilities. Most users come from research organisation or academia, 3 from the public sector and 4 from the private sector. One target for the next call will be to increase this category of users.

Strategic metrics

The strategic metrics measure whether the access provision achieves the expected effects in the short, intermediate, and long term, suggesting indicators for evaluating the relevance and impact of the service provision. The table below will be developed further in ACTRIS IMP MS 7.6

Category	Performance Indicator (suggested KPIs are indicated in bold)	Value type	Definition
Impact on communication	Increase in number of communication activities	quantitative	Measure of dissemination capacity
	Number of citations of ACTRIS-related publications	quantitative	Measure of enlarged scientific audience
	Number of communications in media	quantitative	Measure of public visibility
Impact on outreach	**Increase in number of user requests**	quantitative	Measure of growth of user needs
	Increase in number of services provided	quantitative	Measure of growth of service capacity
	Increase in number of users served	quantitative	Measure of growth of user community
	Increase in number of users from different countries	quantitative	Measure of growth of user community
Impact	Increase in number of users in the atmospheric domain	quantitative	Measure of capacity to respond to user needs in ACTRIS scientific domain

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Category	Performance Indicator (suggested KPIs are indicated in bold)	Value type	Definition
	Increase in number of users from other than atmospheric domain	quantitative	Measure of cross-disciplinary capacity
	Increase in new services offered to users	quantitative	Measure of capacity to adapt to evolving user needs
	Number of citations of ACTRIS-related publications	quantitative	Measure of relevance of research output due to ACTRIS
	Number of peer-reviewed papers resulting from use to services	quantitative	Measure of production of knowledge due to ACTRIS services
Impact on technology	Increase of measurement quality	qualitative	Measure of capacity for improvement: very low (1), low (2), moderate (3), high (2), very high (5)
	Degree of technological development (instrument testing, development, new products)	semi-quantitative	Measure of capacity for technological development resulting from services: very low (1), low (2), moderate (3), high (2), very high (5)
Impact on training	Increase in number of young users and early career scientists	quantitative	Measure of training capacity
	Increase in number of new users from new regions/countries	quantitative	Measure of training capacity
Impact	**Increase in number of users from private sector**	quantitative	Measure of attractiveness towards the private sector

7. Next steps and conclusions

This document summarizes the current status of the ACTRIS IMP TNA access pilot up to M25 of the project. The assessment will serve as a basis for the deliverable D7.1 Recommendations for optimizing the access process and user interaction.

An open call for access is envisaged for Call 3, making use of the PASS platform. The focus will be to test PASS and the actor's interactions via it and provide opportunities to private sector access. The timing and implementation will be discussed with SAMU and access providers, in particular to avoid confusion with other access opportunities like ATMO-ACCESS. The lessons learnt from previous experiences, detailed in section 5, will be implemented for this last call. The conducted calls are an evolutive process for implementing access and help to improve step by step by learning from the results from each call.

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8. Reference documents

ACTRIS IMP MS7.1 Definition of the pilot access process to ACTRIS facilities

ACTRIS IMP MS6.5 2nd draft of the ACTRIS Management Plan

ACTRIS Data Policy

ACTRIS Access Policy

ACTRIS IMP Grant Agreement (N° 871115)

ACTRIS PPP MS26 Definition of Key Performance Indicators related to ACTRIS service provision

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Annex 1: Examples of TNA activity reports

Below are examples of the reports on the TNA activity from user as scientific activity report (Annex 1A) or from facility as service provision certificate (Annex 1B) depending on the service accessed. Due to the required time for analysing the TNA results, these reports are preliminary andnot readily available after each TNA visit. In the case of research services, it is the base for publications – often published one to two years after the access.

A. Example of ACTRIS IMP Scientific Activity report

ACTRIS IMP Scientific Activity report: C1-ACD-1

Burn Chamber experiments for Fire, Land and Atmospheric Remote sensing of EmissionS - FLARES

[Project leader: Dean Venables ; Authors and Affiliation: Clara Felberbauer, , Dean Venables , Stig Hellebust

School of Chemistry, University College Cork;]

Is the information provided in the report confidential and should not be made available on the ACTRIS website?

☒ No, the information can be made public.

☐ Yes, the information should not be made public and access should be restricted to SAMU, the ACTRIS IMP access providers and the reviewers concerned.

1. Introduction and motivation

Globally, vegetation fires were estimated to emit 2.5 x 10^{12} g C/year between 2001 and 2010 (Randerson, 2012). Gases and particulate matter emitted during fire events impacts on air quality, global climate as well as human health (Reid, et al., 2016). In Ireland, wildfires and upland burning is a frequent phenomenon and around 4,000 to 16,000 ha is burned annually. Deterioration of local air quality in nearby towns and cities is a noted concern. However, the air quality and climate implications of Irish wildfires are poorly understood. The EPA-funded FLARES (Fire, Land and Atmospheric Remote sensing of EmissionS) project aims to improve the accuracy of emissions estimates from vegetation fires in Ireland and assess their climate and air quality implications.

2. Scientific objectives

A broad body of field and laboratory studies for emission factors of various biomass exists internationally (Abdulraheem et al., 2020; McClure et al., 2019; Zhou et al., 2017) but the vegetation specific to Ireland that is most prone to fires has not been studied previously. Aims of this series of experiments are A) to measure primary emissions and determine emission factors (EFs) specific to Irish wildland fire fuels B) to study the atmospheric aging behavior of smoke from Irish wildland fuels, especially the formation of secondary organic aerosol (SOA).

3. Reasoning for choosing station / infrastructure

The Leibniz Institute for Tropospheric Research (TROPOS) actively researches and publishes on atmospheric processes. The institute hosts both a highly – equipped atmospheric simulation chamber (ACD-C, Atmospheric Chemistry Department – Chamber) as well as the Leipzig Biomass Burning Facility (LBBF), with an established routine for biomass burning experiments. The Organic Tracers and Aerosol Constituents - Calibration Centre (OGTAC-CC) provides the

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opportunity to directly analyze filter samples from chamber and biomass burning experiments for organics and biomarkers.

4. Method and experimental set-up

Two sets of experiments were performed during the TNA: A) measurements of primary emissions for further calculation of EFs, B) measurements of secondary emissions and formation of SOA under different aging conditions.

For experimental setup A, primary emissions from heather (*Calluna vulgaris)*, gorse (*Ulex europeus*) and purple moorgrass (*Molinia caerula*) were measured. Triplicate experiments were performed for each fuel type to ensure repeatability. For each EF burn, 50g of fuel were weighed and burnt in a conventional woodstove connected to several instruments for the duration of the burn (2-4min). The experimental setup is illustrated in **Error! Reference source not found.**. Additionally, a longer burn (about 15 min) was performed to see how values compare to more stable fire conditions.

Figure 1: Setup of woodstove at LBBF.

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During experimental setup B, atmospheric aging of wildfire emissions was simulated at TROPOS Atmospheric Chemistry Department Chamber (ACD-C), a 19 m^3 chamber made from Teflon FEP (setup in Figure 2). Triplicate experiments were conducted for each fuel under varying conditions: a) UV lights (daytime aging) b) UV lights + addition of OH radical (daytime aging under more reactive conditions) c) no lights + O3 addition (night-time aging).

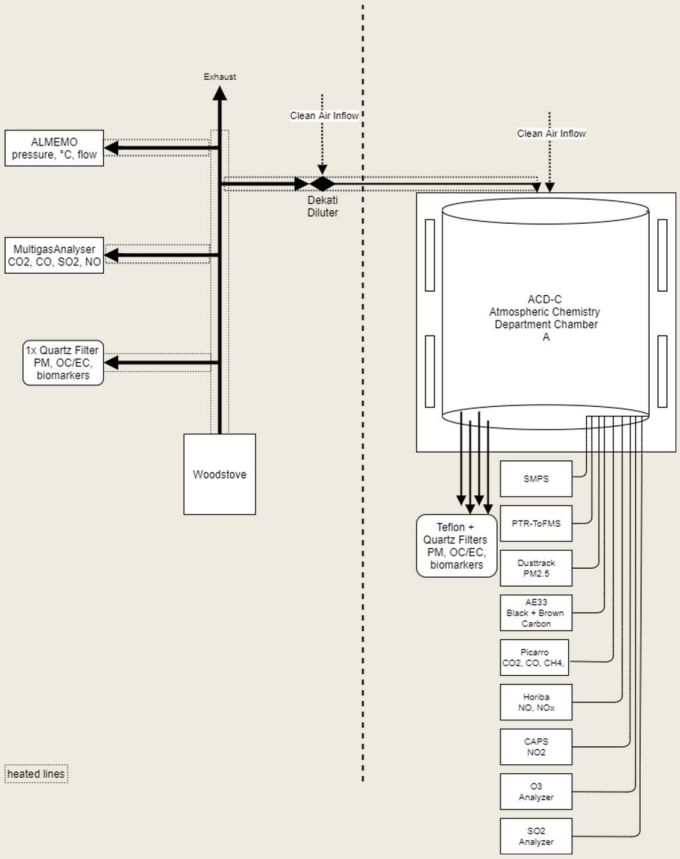

Figure 2: Atmospheric Chamber set-up.

The following gases and aerosols were measured during both experimental setups: CO_2, CO, SO_2 and NO with a Dr Foedisch MGA 12 MultigasAnalyser; $PM_{2.5}$ with a Dusttrak II Aerosol Monitor 8532; Black and Brown Carbon, two aerosols significantly contributing to climate change, with a Magee Scientific Aethalometer AE33; CO_2, CO and CH_4 with a Picarro G2401 Cavity Ringdown Spectrometer; NO, NO_2 and NO_x with a Horiba APNA 370 analyzer, and SO_2 concentrations with a Thermo Environmental Instruments Inc. Pulsed Fluorescence SO_2-analyser. Filter samples are analysed for elemental and organic carbon (EC/OC) as well as biomarkers (levoglucosan, nitrophenol, nitrocatechol, vanillic acid and nitroguaiacol).

5. Impact of COVID on the project (if relevant)

Initial plans to start the TNA in April 2021 had to be pushed back to July 2021 due to COVID restrictions and delays. However, the TNA was finally performed within the planned timeframe and successfully completed.

6. Preliminary results and conclusions

Two types of experiments were carried out. In one set of experiments (Setup A), EFs from primary emissions were measured directly, while Setup B used the atmospheric simulation chamber to study the aging of the emissions and the formation of secondary aerosol.

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Setup A

Analysis of data from chamber experiments and EF calculations are still ongoing, but preliminary results mainly from online instruments are promising. Table 1 shows the EFs for grass and gorse experiments. Compared to a comprehensive review of literature EFs (Andreae and Merlet, 2001), our preliminary EF values are marginally lower for CO_2 (900-1400 compared to 1400-1700), and significantly lower for $PM_{2.5}$ (0.9-9.0 compared to 40-20) and CO (7.3-41.4 vs 45-150). Our low EFs for CO may be a result of the relatively lean combustion conditions for these non-woody fuels leading to more complete combustion and the formation of small particles. $PM_{2.5}$ measurements were made using an optical scattering technique which would be insensitive to the small particles produced. Gravimetric analysis of filter samples (ongoing) will provide a more accurate estimate of $PM_{2.5}$ emissions as well as chemical composition. Andreae and Merlet used a range of biomes and burn scenarios, namely savanna and grassland, tropical forests, extratropical forests, biomass burning and agricultural residue burning. The biome where the fuels for this study originated was not included in their review and may account for some of the differences. EF calculations for heather as well as for SO_2, NOx, BC, CH_4, total PM are in progress.

Table 1: Preliminary EFs (g/kg fuel) for Irish wildfire fuels

fuel	**CO_2**		**$PM_{2.5}$**		**CO**	
	min	max	min	max	min	min
heather	not available yet					
grass	1108	1397	1.0	1.6	7.3	12.7
gorse	923	1367	0.9	9.0	27.0	41.4
(Andreae and Merlet, 2001)	**1400-1700**		**4.0-20**		**45-150**	

Setup B

Chamber aging experiments with UV light, O_3, or OH oxidation revealed differences in initial particle number concentrations depending on fuel and burning conditions. For grass burns, for example, total particle numbers ranged from 42×10^3 to 50×10^3, while for gorse burns the range was 49×10^3 to 79×10^3. Care was taken to homogenize the fuel addition to the fire to minimize burn-to-burn variations.

Gorse combustion was characterized by high VOC emissions as measured by an online PTR-ToF-MS. Particle growth was observed in all aging experiments, although changes in particle mass concentration were modest.

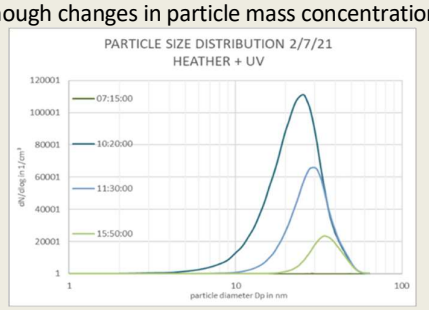

Figure 3: Particle growth during heather photolysis chamber experiment.

New particle formation was observed in the moor grass photolysis (moor grass + UV lights) scenario (Figure 4), indicated by the large number of particles below 10 nm and subsequent growth into a double peaks which are visible after the reaction progresses. Overall, particle aging contributed little to the particle mass concentration of heather (Figure 3) and moor grass (Figure 4) emissions.

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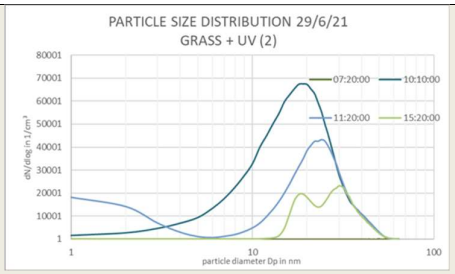

Figure 4: Particle formation during moor grass photolysis chamber experiment.

Ongoing analysis of chamber experiments includes analysis of OC/EC, PTR-ToF-MS, PM and online gas analyzer data.

7. Outcome and future studies

This project will help improve characterization and quantification of Ireland's greenhouse gas emissions and air pollution due to vegetation fires by providing EFs for biome-specific fuels. Moreover, it will provide insights on the atmospheric evolution, in particular PM fate, of smoke from Irish vegetation fires.

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B. Example of Calibration certificate:

C1-CARS3

ACTRiS

AERONET-Europe Calibration Sensing Automatic Sun/Sky/Lunar Photometers (CARS-ASP-FR)

Service National d'Observation
PHOTONS/AERONET-EARLINET
Laboratoire d'Optique Atmosphérique
CNRS-Université de Lille
Villeneuve d'Ascq,France

Calibration Certificate

(ACTRIS IMP Transnational Access to CARS-ASP-FR))

Photometer: # 1149

Project leader : Tanja Dreischuh
Institute of Electronics
Laser Radars Laboratory
1784 Sofia, Bulgaria

I, Philippe Goloub, herewith confirm that in the context of ACTRIS Transnational Access the following instrument services were performed at the ***CNRS CARS Unit*** *of the European AERONET Calibration Service Centre*:

☒ Calibration/maintenance of field instrument
☐ Calibration of reference instrument
☒ Final functional test
☒ Calibration update in AERONET database
☒ Data reprocessing applied
☒ Data raised to QA level (AERONET level 2)

Project Acronym: AELOA_ BG_SOF1-21 **Calibration date :** 14/06/2021

The calibration process of the instrument was carried out

☒ successfully after 1☒ 2☐ 3☐ calibration process (unit of access).

Standard AERONET ☒ Non AERONET user & CIMEL customer ☐ Other types of Instrument ☐

The next calibration/maintenance is recommended in about 12 months after the present calibration date.
The PI will have to submit a new TNA application form for that purpose, including an update of the publications.

Important notice to user:
- Daytime AOD are traceable to GAW/PMOD/WRC (OHP Observatory) and AERONET (NASA/Mauna Loa)
- Radiance calibration is traceable with AERONET (NASA/GSFC)

Comments to user:

Villeneuve d'Ascq 25/06/2021
Signature of access provider

(P. Goloub)

Reminder: *the following* acknowledgement sentence is mandatory for all publications: *Authors acknowledge AERONET-Europe for providing calibration service. AERONET-Europe is part of ACTRIS-IMP project that received funding from the European Union (H2020-INFRADEV-2018-2020) under Grant Agreement No 871115*

1

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